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Maintenance Workforce Characteristics

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Regina S. Clifford
Joseph Callender II
Norman T. O'Meara

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Clifford, Regina S.
Callender II, Joseph
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Mr. Robert T. Mason
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14. ABSTRACT
We identified the characteristics of the FY01 DoD maintenance workforce, placing it in the larger context of the total DoD workforce and analyzing trends from FY97 to FY01. We evaluated the workforce in terms of age, years of service, retirement eligibility, Armed Forces Qualification Test scores, education, skills, and female and minority representation. We found a significant decrease in the average years of service for active duty enlisted maintainers in the mid-career brackets; decreases in the percentage of minority representation in both blue collar and white collar civilian segments; and decreases in total numbers of both civilian segments (almost double the reductions of total numbers for maintainers and DoD overall). Other decreases and changes in the remainder of the population were otherwise consistent with reductions throughout DoD.

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LOGISTICS MANAGEMENT INSTITUTE
2000 CORPORATE RIDGE
MCLEAN, VIRGINIA 22102-7805

Executive Summary

The Office of the Secretary of Defense has a continuing interest in the structure of the maintenance workforce. To further that interest, the Assistant Deputy Under Secretary for Maintenance Policy, Programs, and Resources (ADUSD[MPP&R]) tasked the Logistics Management Institute to update previous workforce studies, specifically to determine the size and characteristics of the current (ending FY01) workforce as well as past trends over the previous 5 years (FY97–FY01). For our evaluation, we divided the maintenance workforce into eight segments:

- Active duty enlisted, commissioned officers, and warrant officers
- Selected reserve enlisted, commissioned officers, and warrant officers
- Civilian blue-collar and white-collar maintainers

Within each of these segments, we examined the following characteristics:

- The average age, years of service (YOS), and retirement eligibility
- Scores on the Armed Forces Qualification Test, and educational levels
- Distribution of skills
- Diversity within the maintenance workforce regarding female and minority representation.

We also compared these characteristics to those of the non-maintainer workforce. In addition, to place any changes within a larger context, we identified relevant trends in the commercial sector and the U.S. population.

In FY01, there were approximately 696,800 maintainers (24 percent) within the total Department of Defense population of 2.9 million. This percentage remained constant over the period of our study, despite personnel reductions throughout DoD. Active duty and selected reserve enlisted and blue-collar maintainers comprised 92.1 percent of the total maintainer workforce. Officer, warrant officer, and white-collar maintainers totaled 7.9 percent. The size and selected characteristics of the FY01 workforce are portrayed in Table ES-1.

Table ES-1. Summary of Size and Characteristics of the DoD Maintenance Workforce, FY01

Segment	Total numbers (thousands)	Years		Percentage of workforce		
		Average age	Average years of service	Average retirement eligible	Female representation	Minority representation
Active duty enlisted	366.1	27.6	7.5	6.3	7.6	32.0
Active duty officer	9.7	36.6	15.2	29.1	11.6	21.2
Active duty warrant officer	4.2	39.0	19.1	38.0	4.1	34.2
Selected reserve enlisted	184.2	33.5	14.0	21.3	7.9	22.0
Selected reserve officer	5.6	39.5	17.9	35.6	15.8	19.5
Selected reserve warrant officer	2.8	46.7	25.6	73.5	3.3	11.2
Blue collar	91.7	45.1	17.2	5.5	5.4	24.0
White collar	32.6	47.8	19.8	11.1	12.9	18.6
Total number	696.8					

Note: Totals reflect rounding. Percentage calculations based on actual data.

Over the 5-year period, the maintenance workforce declined 5.5 percent, compared to a 5.4 percent reduction of the overall DoD population.

Table ES-2 portrays the size of each segment from FY97 to FY01. In FY01, active duty enlisted maintainers comprised the largest segment, with a population of 366,093. This segment experienced a 4.1 percent decrease in total numbers, slightly below the 5.4 percent decrease for the overall maintenance workforce. The civilian blue-collar and white-collar populations both declined nearly 10 percent over the 5-year period. A large decline in the selected reserve commissioned officer segment (16.1 percent) was somewhat offset by a 9.5 percent increase in the selected reserve warrant officer segment. The remaining segments declined at rates fairly close to those of the overall maintenance workforce.

Table ES-2. Size of DoD Maintenance Workforce by Segment (in thousands)

Segment	FY97	FY98	FY99	FY00	FY01
Active duty enlisted	381.7	376.3	369.0	366.2	366.1
Active duty commissioned	10.3	9.9	9.7	9.6	9.7
Active duty warrants	4.4	4.3	4.1	4.4	4.2
Selected reserve enlisted	193.5	189.3	185.9	183.4	184.2
Selected reserve commissioned	6.6	6.5	6.6	6.1	5.6
Selected reserve warrants	2.5	2.6	2.7	2.7	2.8
Civilian blue collar	101.7	97.4	93.0	91.8	91.7
Civilian white collar	36.1	34.2	33.0	32.8	32.6
Total	736.9	720.5	704.1	696.9	696.8

Note: Totals reflect rounding.

Changes in selected characteristics are portrayed in Table ES-3. There are three areas that are particularly noteworthy. First, the active duty enlisted segment experienced a 10.2 percent decrease in the number of years of service. Second, there were declines in minority representation in both the blue- and white-collar civilian

maintenance workforce. Third, both civilian segments declined nearly 10 percent in total numbers over the 5-year period.

Table ES-3. Summary of Changes in Maintenance Workforce Characteristics, FY97–FY01

		Total numbers	Age	YOS	Eligible for retirement	Female representation	Minority representation
Active duty	Enlisted	▼ –4.1%	▼ –2.9%	▼ –10.2%	▲ +0.7	▲ +0.7	▲ +3.3
	Officer	▼ –5.8%	▲ +1.0%	▲ +2.7%	▲ +1.1	▲ +0.4	▲ +2.4
	Warrant officer	▼ –3.7%	▲ +0.9%	▲ +0.9%	▼ –5.6	▲ +0.8	▲ +3.7
Selected reserve	Enlisted	▼ –4.8%	no change	▲ +13.8%	▲ +3.1	▲ +1.6	▲ +1.4
	Officer	▼ –15.9%	▲ +3.1%	▲ +7.6%	▲ +4.2	▲ +1.4	▲ +2.3
	Warrant officer	▲ +9.5%	▼ –1.6%	▼ –2.4%	▼ –5.2	▲ +1.7	▲ +2.8
Civilian	Blue collar	▼ –9.8%	▲ +0.9%	▲ +1.0%	▲ +1.9	▲ +0.4	▼ –0.5
	White collar	▼ –9.8%	▲ +1.5%	▲ +3.1%	▲ +2.6	▲ +0.3	▼ –0.5

At the end of FY01, there were 707 occupational series in the DoD civilian workforce. From these, we designated 177 as maintenance skills. The enlisted and blue-collar occupations (divided into electrical/mechanical equipment repair, electronic equipment repair, and crafts categories) experienced a number of internal shifts of personnel, or "recategorizations" of specialties. Shifts in officer, warrant officer, and white-collar categories appeared consistent with overall workforce declines or were offset by increases in other areas.

Following are exceptional changes noted in the maintenance workforce between FY97 and FY01:

- A decrease of 10.2 percent in average YOS for active duty enlisted, due to sharp declines in the 6–10, 11–15, and 16–20 YOS brackets.
- Decreases in the percentage of minority representation in both civilian segments—This was particularly noteworthy when compared to increases in the other segments, the non-maintainer workforce, and the U.S. population as a whole (2 percent from 1995 to 2000).[1]
- A decrease of 9.8 percent in total numbers in both civilian segments (almost double the reductions in total numbers for maintainers and DoD

[1] Richard W. Judy and Carol D'Amico, *Workforce 2020: Work and Workers in the 21st Century*, Hudson Institute, 1997. Hudson Institute researchers maintain that minority representation in the U.S. population is growing slowly but steadily. This slow national growth, however, masks great regional differences, with the western states, particularly California, growing much more rapidly than other portions of the country.

overall)—Most noteworthy was the 15.5 percent decline of blue-collar crafts workers, which comprise 25 percent of the blue-collar workforce.

- Decreases and changes in the remainder of the population, were otherwise consistent with reductions throughout DoD—Data generally indicated internal shifting of personnel between specialties or "recategorizing" within skill subcategories.

Based on these findings, we conclude that, during the 5 years of our study,

- the DoD maintainer workforce contraction was consistent with that of DoD in general,
- there was substantial loss of critical mid-career maintainers,
- there was loss of minority representation in both segments of the civilian workforce, and
- the losses in the civilian workforce are almost double that of the overall DoD population.

Contents

FIGURES

TABLES

Chapter 1
Introduction

The Office of the Secretary of Defense has a continuing interest in the structure of the Department of Defense maintenance workforce. To further that interest, the Assistant Deputy Under Secretary for Maintenance Policy, Programs, and Resources (ADUSD[MPP&R]) tasked the Logistics Management Institute to update previous workforce studies, specifically to determine the size and characteristics of the current (ending FY01) workforce as well as trends over the previous 5 years (FY97 to FY01). Specifically, we

- identified the characteristics of the FY01 maintenance workforce, placing it in the larger context of the total DoD workforce;
- sought to understand changes in the maintenance workforce characteristics over 5 years (FY97–FY01); and
- analyzed trends in maintenance workforce characteristics that may require policy or programmatic action with regard to the maintenance workforce.

This study considered active duty, selected reserve, and civilian maintainers, segregated into workforce segments (enlisted, officer, warrant officer, and blue and white collar). We also looked at trends in the commercial sector that might relate to DoD workforce issues.

BACKGROUND

The 1990s were a time of great flux for DoD, with numerous factors influencing its size and composition. Following are among the most notable of these factors:

- The end of the Cold War and the Persian Gulf War—There have been significant defense personnel reductions in the last decade caused by shifts in perceived tensions around the world. These reductions were related to numerous Base Realignment and Closure actions and, in an attempt to gain efficiency and cost effectiveness with a shrinking force, changes in maintenance practices, such as the implementation of two-level maintenance (2LM) and contractor logistics support (CLS). From FY97 to FY01, DoD experienced an overall workforce decline of 5.4 percent.
- The redefinition of national defense strategies—Shifting tensions and pockets of conflict have drawn senior defense planners away from the previous strategy of fighting two simultaneous major theater wars

(MTWs). Instead, more emphasis is being placed on peacekeeping and humanitarian missions scattered across the globe.

- A strong national economy—As a result of the tremendously long economic growth period in the 1990s, many young people opted to work in the commercial sector or attend college to obtain higher paying positions than what was offered by the military. Those considered in the pool of high-quality recruits are people with high school diplomas and who score in the top 50th percentile on the Armed Force Qualification Test (AFQT). Because more young people opted for the commercial sector experience or for college, the military services failed to meet their recruiting and retention goals for much of the 1990s; only in the last few years have they begun to see some modest improvement. To achieve this improvement, the military services dramatically increased the recruiting and retention budgets in order to attract the highest quality young person.

METHODOLOGY

We initially conducted a literature search of workforce issues to gauge the tenor of the military and commercial populations. We were interested in commercial sector trends because of their impact on the pool of military recruits. We also reviewed statistics from DoD and the Department of Labor to determine trends and statistical relationships.

We structured the maintenance workforce by identifying maintenance career fields within the DoD Occupational Conversion Index (DoD 1312.1-I), which provides uniform coding across the military services for the various occupational specialties. Using these definitions, we obtained data from the Defense Manpower Data Center for the 5-year period (FY97–FY01). We analyzed trends in age, years of service, retirement eligibility, quality (utilizing scores from the AFQT and levels of formal education), skills, and female and minority representation.

SUMMARY OF FINDINGS

Figure 1-1 depicts the total number of maintainers compared to the overall DoD population by segments. The total number of maintainers in FY01 was 696,827, approximately 24 percent of the total DoD workforce of 2.9 million. This percentage was fairly constant during the study period. Table 1-1 depicts the size of the maintenance workforce by its various segments.[1] The overall size of this workforce decreased 5.5 percent from FY97 to FY01, which is consistent with the 5.4 percent decline of the overall DoD workforce.

[1] For the purpose of this paper, DoD segments are classified as active duty enlisted, active duty officer, and active duty warrant officer; selected reserve enlisted, selected reserve officer, and selected reserve warrant officer; and blue-collar and white-collar civilians.

Figure 1-1. FY01 DoD Population (in thousands)

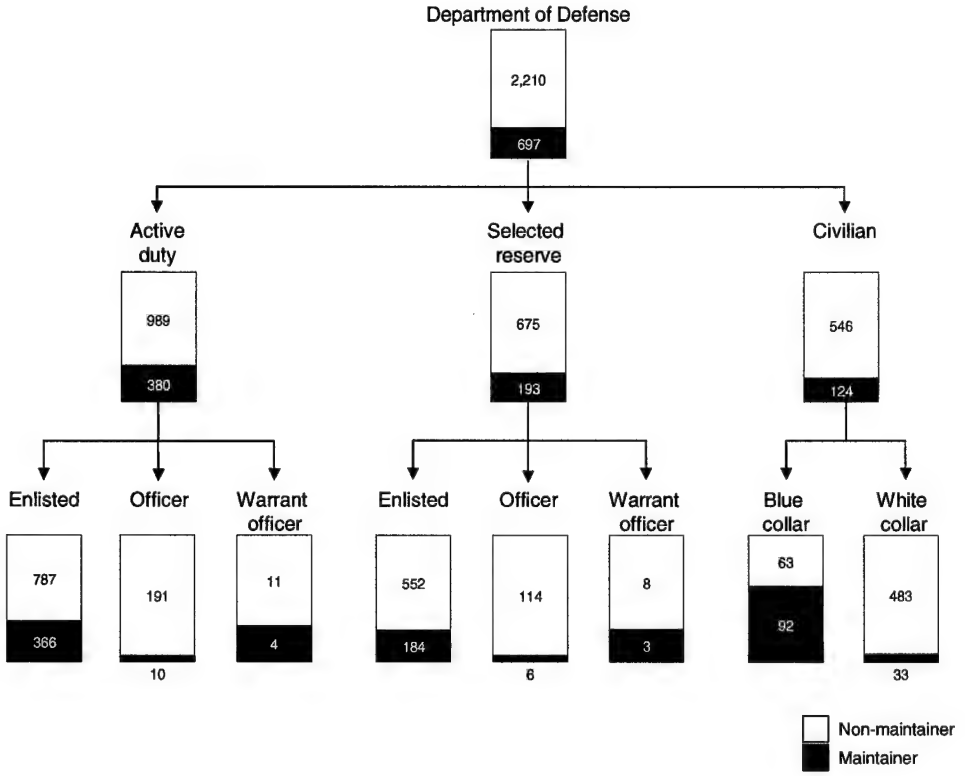

Table 1-1. Size of DoD Maintenance Workforce by Segment (in thousands)

Segment	FY97	FY98	FY99	FY00	FY01
Active duty enlisted	381.7	376.3	369.0	366.2	366.1
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Selected reserve warrants	2.5	2.6	2.7	2.7	2.8
Civilian blue collar	101.7	97.4	93.0	91.8	91.7
Civilian white collar	36.1	34.2	33.0	32.8	32.6
Total	736.9	720.5	704.1	696.9	696.8

Note: Totals reflect rounding.

The greatest changes were in the areas of selected reserve officers (15 percent decrease) and selected reserve warrant officers (12 percent increase), followed by civilian maintainers, both blue and white collar (almost a 10 percent decrease in both segments). The other segments depicted in Table 1-1 show decreases in the 4–6 percent range. Table 1-2 presents a summary of the overall changes in the maintenance workforce.

Table 1-2. Summary of Changes in Maintenance Workforce Characteristics

Characteristic	Change
Age	The average age decreased slightly in active duty enlisted and selected reserve warrant officers. Selected reserve enlisted remained the same. There were increases in all other segments, with selected reserve officer and white-collar civilians achieving the largest percentage increases.
Years of service (YOS)	Active duty and selected reserve enlisted maintainers and selected reserve warrant officer maintainers saw decreases in average YOS. All other segments saw increases, with the greatest being the selected reserve officers.
Retirement eligibility	The number of individuals eligible for retirement in the active duty and selected reserve warrant officers decreased. All other segments saw increases, with the greatest percentage changes in selected reserve enlisted and officers.
AFQT score	The large number of unknown AFQT scores for both active duty (33 percent) and selected reserve (15 percent) prevented definitive analysis; however, the known scores remained fairly constant.
Education	Active duty officers saw a large decline in the number of college graduates. Blue- and white-collar maintainers experienced small increases in high school graduates, with corresponding decreases in college graduates. All other segments saw increases in the number of college graduates.
Skills	Recategorization actions dominated multiple segments, producing wide swings in some subcategories, but there were relatively small changes overall.
Female representation	The number of women increased in all segments, with the largest percentage increases in the selected reserve segments.
Minority representation	Both blue- and white-collar civilian maintainer segments saw decreases in the number of minorities. All other segments experienced increases, with the active duty warrant officer segment showing the greatest percentage increase.

TRENDS AND ISSUES

We discovered several interesting trends and issues in the DoD maintenance workforce:

- Loss of experienced mid-level maintainers—Most of the DoD segments saw decreases in their critical experience age groups (25–34, 35–44, and 45–54 years of age).
- An aging workforce—Six of the eight segments saw overall increases in age. Most saw increases in the 45–54 age group with corresponding increases in the youngest group (less than 24). Five of the eight segments had increases in years of service (YOS), but the active duty enlisted saw a 10 percent decrease in this area.
- Advancing technology—The increasing complexity of weapon systems demands an increasingly educated and skilled workforce.
- Increased deployments—Rather than requiring fewer people as a result of changing from the two MTW concept and implementation of 2LM and

CLS, the military services find themselves stretched too thin to support numerous smaller, regionalized conflicts and missions.

Trends in the commercial sector workforce are important to the DoD maintenance workforce because it is from the commercial pool that DoD largely draws and competes to retain its employees. Of the maintainers with 5 or fewer years of service, many had commercial work experience before joining the defense community, as indicated by the fact that 82 percent of the civilian maintainers are 25 years of age or older. Indeed, 61 percent of the white-collar maintainers and 44 percent of the blue-collar maintainers are 35 or older. For the active duty and selected reserve maintainers with 5 or fewer years of service, almost 14 percent and 20 percent (respectively) are 25 or older.

Following are some major commercial trends:[2]

- Advancing globalization—Competition on the global scale will affect economies, manufacturing, employment, and employment attitudes. Retraining and frequent job changes are becoming commonplace.

- Aging and smaller worker pool—As the baby boom generation ages, more work programs will develop to accommodate this large wave of workers, such as flexible work options. In addition, the generations that follow the baby boomers are smaller, creating a smaller worker pool. Skilled workers will be in demand and may very well be able to consult or contract their services, thereby retaining a great deal of control over their environment and schedules.

- Increasing diversity—Minority and female representation in the workforce continue to expand. This creates opportunities and challenges for educational achievement and flexibility in working conditions. The contingent or temporary worker segment is also increasing, with women and minorities filling these positions with greater frequency than men and non-minorities.

These three trends indicate movement away from long-term employment with a single employer. The increasingly educated pool from which the defense community will want to draw to support its advanced technological weapon systems may well seek flexibility in and control over their work environments (for example, consulting and telecommuting options). These flexible work conditions may not be very adaptable to the current defense maintainer environment.

[2] Richard W. Judy and Carol D'Amico, *Workforce 2020: Work and Workers in the 21st Century*, Hudson Institute, 1997.

REPORT ORGANIZATION

Chapter 2 of this report addresses the characteristics of the active duty maintenance workforce, divided into enlisted, officer, and warrant officer segments. Chapter 3 portrays the same division of the selected reserve, and Chapter 4 is devoted to the civilian maintenance workforce.

Chapter 2
Active Duty Military Maintainers

In FY01, there were 380,000 active duty military maintainers, constituting about 28 percent of the total active duty force. This segment of maintainers comprises 54 percent of the total number of DoD maintainers (about 700,000 strong)—the other two segments being the selected reserve and civilian maintainers—and comprises the bulk of the front-line, organizational-level maintenance performed throughout the world. Those active duty maintainers not involved directly in field operations are found in critical support positions, such as headquarters staff, recruiting positions, and in teaching positions at the various technical schools.

Table 2-1 shows the 4.1 percent decrease in the active duty maintainer population over the FY97–FY01 timeframe. This population decreased proportionately with the overall reduction of the total active duty force, which saw a 4.2 percent decrease during the same 5-year period.

Table 2-1. Number of Active Duty Maintainers (in thousands)

Segment	FY97	FY98	FY99	FY00	FY01	Percentage change FY97 - FY01
Enlisted	381.7	376.3	369.0	366.2	366.1	-4.1
Commissioned	10.3	9.9	9.7	9.6	9.7	-5.9
Warrants	4.4	4.3	4.1	4.4	4.2	-3.7
Total	396.4	390.5	382.9	380.2	380.0	-4.1

Note: Totals reflect rounding. Percentage calculations based on actual data.

Officers—commissioned and warrant—constituted 3.7 percent of the total active duty maintainers in FY01. Commissioned officers declined over the last 5 years at a slightly higher rate than enlisted personnel. Enlisted personnel declined 4 percent between FY97 and FY01.

Active Duty Enlisted Maintainers

The active duty enlisted maintainer workforce totaled 366,100 in FY01 (or 31.8 percent of the total DoD active duty enlisted workforce of almost 1.2 million). Non-maintainers in this segment totaled 787,300 for the same period.

The proportion of enlisted maintainers for each service remained relatively constant over the FY97–FY01 period, as shown in Table 2-2. For FY01, the proportions are as follows:

- Army—23.7 percent of total enlisted maintainers
- Navy—37.1 percent of total enlisted maintainers
- Marine Corps—10.7 percent of total enlisted maintainers
- Air Force—28.6 percent of total enlisted maintainers.

There was a 4.1 percent decrease in total active duty enlisted maintainers compared to a slightly smaller decrease (3.7 percent) in total active duty enlisted members, as seen in Table 2-2. Despite declines, maintainers have remained a fairly constant percentage of the total active duty enlisted force over the last 5 years.

Table 2-2. Number of Active Duty Enlisted Maintainers by Service (in thousands)

Service	FY97	FY98	FY99	FY00	FY01	Percentage change FY97 - FY01
Maintainers						
Army	91.9	88.3	87.7	89.6	86.6	-5.8
Navy	142.6	138.7	134.0	130.8	135.9	-4.7
Marine Corps	37.8	38.5	38.9	40.2	39.1	3.4
Air Force	109.4	110.8	108.4	105.6	104.6	-4.5
Total	381.7	376.3	369.0	366.2	366.1	-4.1
Total active duty enlisted	1,197.8	1,170.9	1,151.4	1,153.6	1,153.4	-3.7
Maintainers as percent of total	31.9	32.1	32.0	31.7	31.7	-0.1

Note: Totals reflect rounding. Percentage calculations based on actual data.

Age

The average age of active duty enlisted maintainers in FY01 was 27.6 years. This compares with an average of 27.4 years for non-maintainers in this segment. The maintainers were on average a little younger in FY01 than they were in FY97, a 2.9 percent decline over this timeframe (see Table 2-3).

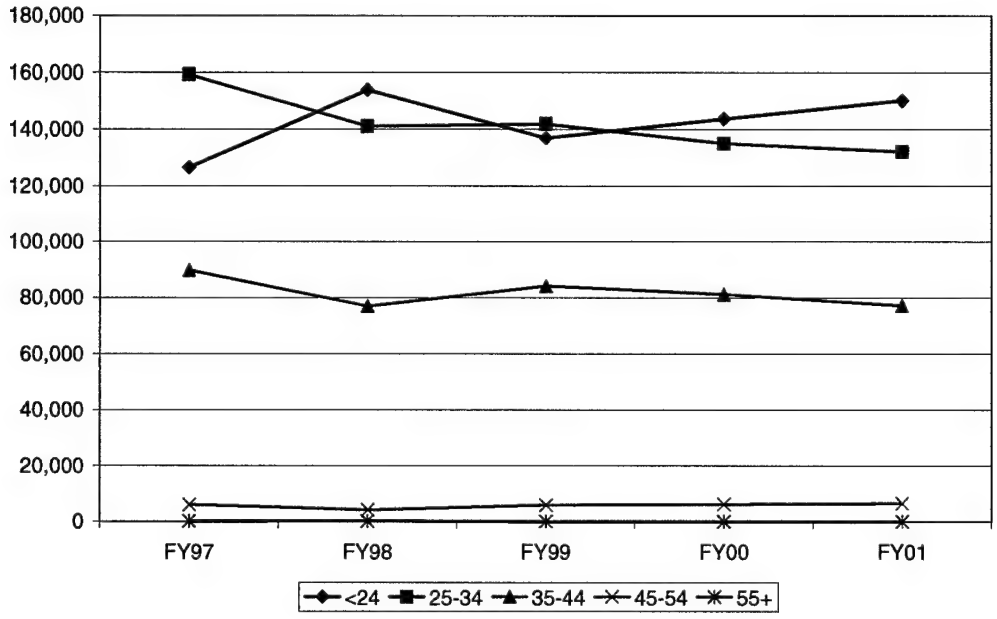
Table 2-3. Average Age of Active Duty Enlisted Maintainers

		Age (in years)					
	Rank	1997	1998	1999	2000	2001	Percentage change
Active duty	Enlisted	28.4	28.2	28.0	27.8	27.6	-2.9%

Note: Totals reflect rounding. Percentage calculations based on actual data.

Figure 2-1 depicts the changes in the various age groups over the study period. Most noticeable are losses (a combined total of 31 percent) in the mid-career age groups, where critical experience and wealth of knowledge reside. There were increases in the 45–54 age group (8.3 percent) and in the under-24 age group (more than 18 percent). Although not evident in the chart (because of their relatively small numbers) is the large decline in the over-55 group (more than 69 percent).

Figure 2-1. Number of Active Duty Enlisted Maintainers by Age Group



Years of Service

The average years of service for the active duty enlisted maintainers was 7.5 years in FY01. Non-maintainers had an average of 7.1 for the same period. This segment of the maintainer population accumulated fewer YOS than 5 years ago, which corresponds to the slight drop in age. Table 2-4 shows a 10 percent decline in the average YOS in this segment of the maintainer workforce. There has been an increase in the numbers of maintainers in the youngest age bracket (under 24), and a corresponding decline in the average YOS. This decline in the average YOS for active duty maintainers corresponds to the decline in the average age of the same segment.

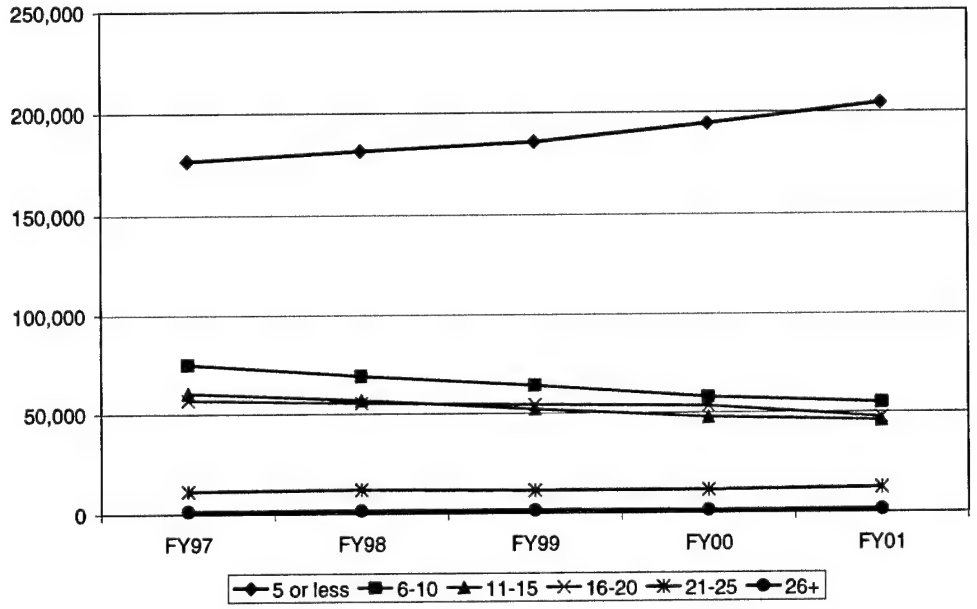
Table 2-4. Average Years of Service for Active Duty Enlisted Maintainers

		Years of service					
	Rank	1997	1998	1999	2000	2001	Percentage change
Active duty	Enlisted	8.3	8.1	8.0	7.7	7.5	-10.2%

Note: Totals reflect rounding. Percentage calculations based on actual data.

Figure 2-2 portrays the sharp declines (27 percent, 24 percent, and 17 percent respectively) evident in the 6–10, 11–15, and 16–20 YOS brackets. In FY97, these three YOS groups, which constitute the biggest share of maintenance experience, comprised 50.4 percent of the active duty enlisted maintainer workforce. By FY01, their numbers had declined to 40.5 percent. There was a corresponding increase in the number of active duty enlisted maintainers with 5 or fewer YOS (a 15.5 percent increase over the 5-year period).

Figure 2-2. Distribution of Years of Service for Active Duty Enlisted Maintainers



Retirement Eligibility

In FY01, 6.3 percent of the total active duty enlisted maintainer population were eligible to retire. For non-maintainers in this segment, the figure was 5.5 percent. For maintainers, this represents a 0.7 percentage point increase (Table 2-5 shows this increase).

Table 2-5. Percentage of Active Duty Enlisted Maintainers Eligible for Retirement

		Retirement eligible				
	Rank	1997	1998	1999	2000	2001
Active duty	Enlisted	5.6%	5.5%	5.3%	5.8%	6.3%

AFQT Score

Approximately 44 percent of the active duty enlisted maintainers scored in the 65th percentile[1] or higher on the AFQT. This percentage compares with a 56th-percentile average for non-maintainers. The scores for maintainer were relatively constant over the 5 years studied, with the exception of an apparent decline in FY01 (see Table 2-6). This is not an actual decline, however, due to the purposeful omission of unknown scores.[2]

Table 2-6. Percentage of Active Duty Enlisted Maintainers with AFQT Scores

		AFQT				
	Rank	1997	1998	1999	2000	2001
Active duty	Enlisted	47.4%	47.7%	47.5%	46.8%	44.0%

The AFQT score, combined with level of education, is considered an indicator of the quality of personnel the services are able to recruit. Generally, individuals with high school diplomas (discussed in the next section) and AFQT scores in the top 50th percentile are considered high-quality recruits. Various studies have shown a strong correlation between higher AFQT scores and job performance.[3] Indeed, emphasizing the importance of higher AFQT scores and the quality of recruits, RAND researchers state

> The research findings imply that a decline in personnel quality will translate into a decline in performance among military personnel. The likely reduction in military performance associated with declines in recruit quality is likely to be felt for some years to come. Past research shows that the quality of personnel the military recruits is the average quality that it retains over the career of a given cohort. For example, if the average AFQT score of a cohort of new recruits is 70, the average quality of those same individuals who are still in service at YOS-5 is still 70. The average AFQT is still 70 when those same individuals who are still in service reach YOS-10, and it is still 70 when those individuals who are still in service reach YOS-15…In other words, the military seems to retain the same quality of personnel it recruits. Therefore, declines in recruit quality are not overcome within a given cohort. If that recruit quality is lower, then so is the quality, and therefore the expected performance, of an entire generation of enlisted personnel. Thus, declines in recruit quality are of particular concern.

[1] This represents the top two AFQT categories, CAT I (93rd–99th percentile) and CAT II (65th–92nd percentile).

[2] For evaluation purposes, the AFQT scores proved to be somewhat problematic. Initial investigation indicated reserve forces scores were typically 10–13 percent lower than active duty scores. The lower scores for the reservists could be attributed to the quantity of unknown scores (generally about 15 percent) for the reserve forces. Further investigation revealed a 33-percent unknown factor for the active duty segment, however, with one service coding all of their scores in the 99th percentile for FY01. To gain consistency across all the services and components, we elected to eliminate all unknown scores and extrapolate from the known quantities. By doing this, the active and reserve forces scores are within 2 to 3 percentage points of each other.

[3] RAND, *Military Recruiting and Retention After the Fiscal Year 2000 Military Pay Legislation*, Beth Asch et al., MR-1532, 2002, p. 40.

Education

The percentage of active duty enlisted maintainers in FY01 with at least a high school diploma was 98.9 percent. Table 2-7 shows that the percentage of these maintainers was consistently around 99 percent over the 5 years of this study.[4] Between FY97 and FY01, there was a 2.5 percent decrease in those labeled "high school graduates," but a corresponding increase in the "some college" category.

Table 2-7. Percentage of Active Duty Enlisted Maintainers by Educational Level

Level	FY97	FY98	FY99	FY00	FY01
Some high school	0.9	1.0	0.9	0.9	1.0
High school graduate	71.2	68.4	68.5	69.0	68.7
Some college	25.4	28.2	28.2	27.8	28.0
College graduate	2.4	2.4	2.3	2.3	2.2

Note: Due to rounding, columns may not total 100 percent; unknowns not included in calculations.

As mentioned earlier, high-quality recruits are considered those having a high school diploma and scoring within the top 50th percentile on the AFQT. The overall AFQT scores of high school graduates have been steadily declining since 1992.[5] On the other hand, the scores of active duty enlisted maintainers have been increasing. Between FY97 and FY00, active duty maintenance recruits increased their scores by 2 percentage points, while overall recruits dropped a corresponding 2 percentage points during the same period.

The pursuit of higher education in our society has shifted from being something reserved for a few individuals to a much sought-after commodity for many people because it offers the greatest opportunity for well-paying jobs and advancement in the business world. Research shows that

> Although the real weekly civilian wages for high school graduates and those with some college have steadily risen over the past two decades, the growth in the real weekly wages of those with a four-year college degree has been enormous. Consequently, the gap between the civilian pay of a high school graduate and the civilian pay of a college graduate has increased. This gap represents the incentive to a high school graduate to attend college.[6]

The promise of higher paying jobs, coupled with the increasing demand for technological proficiency, is propelling ever-greater numbers of high school graduates to college. It is exactly from this pool of technologically proficient (or receptive or trainable) young people that the military needs to draw. To compete with

[4] The categories "high school graduate", "some college", and "college graduate" are all considered to be high school graduates and, as such, total approximately 99 percent.

[5] RAND, *An Analysis of Pay for Enlisted Personnel*, Beth J. Asch et al., 2001, p. vi.

[6] RAND, *Military Recruiting and Retention After the Fiscal Year 2000 Military Pay Legislation*, Beth J. Asch et al., MR-1532, 2002, p. 44.

colleges for these high-quality recruits, the services have increased their recruiting budgets substantially, adding additional funds and recruiters. The services have also started targeting individuals in 2-year college programs and increased enlistment bonuses and educational benefits.[7]

Skills

Our analysis identified maintainers in three categories from the *Occupational Conversion Index*: electrical/mechanical equipment repair, electronic equipment repair, and crafts. The distribution for these categories is provided in Table 2-8. The largest category, electrical/mechanical equipment repair, had a total of 228,500 maintainers in FY01, followed by 101,100 in electronic equipment repair, and 16,400 in crafts.

The greatest decline among the three categories was in electronic equipment repair, with an overall 9.5 percent decrease from FY97 to FY01. The teletype and cryptographic equipment maintenance subcategory experienced the largest decrease, with a 43 percent decrease over 5 years. Within the electrical/mechanical equipment repair category, the precision equipment maintenance career field decreased more than 37 percent over the last 5 years.

Although there are numerous subcategories that show a 9–11 percent decrease over the last 5 years, the overall total decrease was only about 4.1 percent. One likely explanation is the reclassification and consolidation of numerous specialties brought about by reduction, streamlining, and outsourcing efforts. Therefore, large declines in several subcategories equate to only a small overall decline in the number of people.

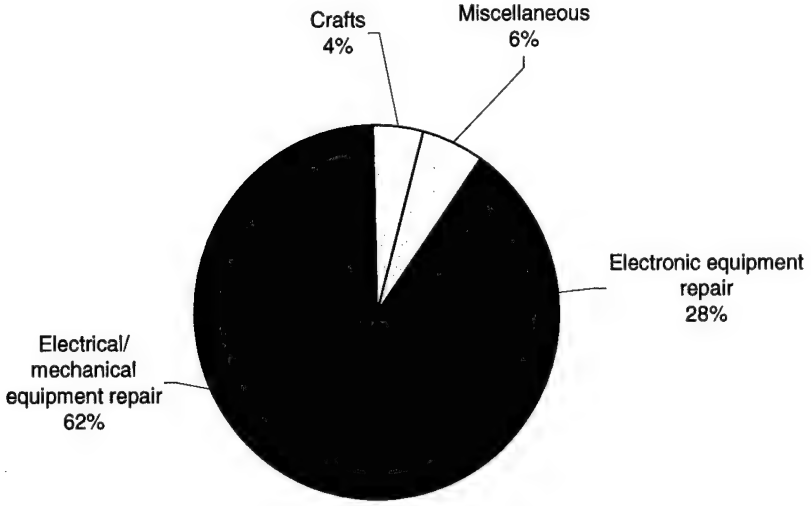
[7] RAND, *Military Recruiting and Retention After the Fiscal Year 2000 Military Pay Legislation*, Beth J. Asch et al., MR-1532, 2002.

Table 2-8. Number of Active Duty Enlisted Maintainers by Skill Category

Category	Subcategory	FY97	FY98	FY99	FY00	FY01
Electrical/ mechanical equipment repair	Aircraft and aircraft related	100,214	97,726	96,919	98,066	100,959
	Automotive	41,068	40,039	39,521	39,980	39,114
	Armament and munitions	30,002	29,601	29,277	28,812	29,929
	Power generating equipment	23,483	23,393	23,148	23,269	23,703
	Shipboard propulsion	23,356	22,025	20,977	19,433	20,793
	Wire communications	10,064	9,420	8,891	8,715	8,919
	Other mechanical and electrical equipment	2,820	2,814	2,736	2,779	2,610
	Missile mechanical and electrical	1,454	1,378	1,358	1,324	1,428
	Precision equipment	1,619	1,432	1,258	1,064	1,010
	Subtotal	234,080	227,828	224,085	223,442	228,465
Electronic equipment repair	Radio/radar	64,932	61,331	61,653	60,544	59,148
	Missile guidance, control and checkout	12,276	11,980	11,865	11,246	12,162
	Other electronic equipment	11,555	11,156	10,881	10,468	10,864
	ADP Computers	5,955	5,758	4,453	4,503	5,299
	Sonar equipment	5,698	5,690	5,631	5,421	5,203
	Fire control electronic systems (nonmissile)	3,706	3,703	3,750	3,766	3,821
	Teletype and cryptographic equipment	6,718	7,081	6,312	5,512	3,820
	Nuclear weapons equipment	894	862	840	784	820
	Subtotal	111,734	107,561	105,385	102,244	101,137
Crafts	Other crafts	9,128	8,325	7,908	8,056	8,633
	Metalworking	8,596	7,441	6,763	6,283	6,093
	Fabric, leather, and rubber	1,774	1,657	1,584	1,605	1,626
Subtotal		19,498	17,423	16,255	15,944	16,352
Miscellaneous		16,410	23,503	23,306	24,548	20,139
Total		381,722	376,315	369,031	366,178	366,093

Figure 2-3 shows that the largest portion of active duty enlisted maintainers is in electrical/mechanical equipment repair (62 percent of 366,100). This category saw the smallest decline among all three categories, with only 2.4 percent fewer people than 5 years earlier. Electronic equipment repair, which represents 28 percent of all maintainers, declined 9.5 percent. The crafts category, with only 4 percent of the active duty enlisted maintainers, declined the most (16 percent in FY01 from FY97).

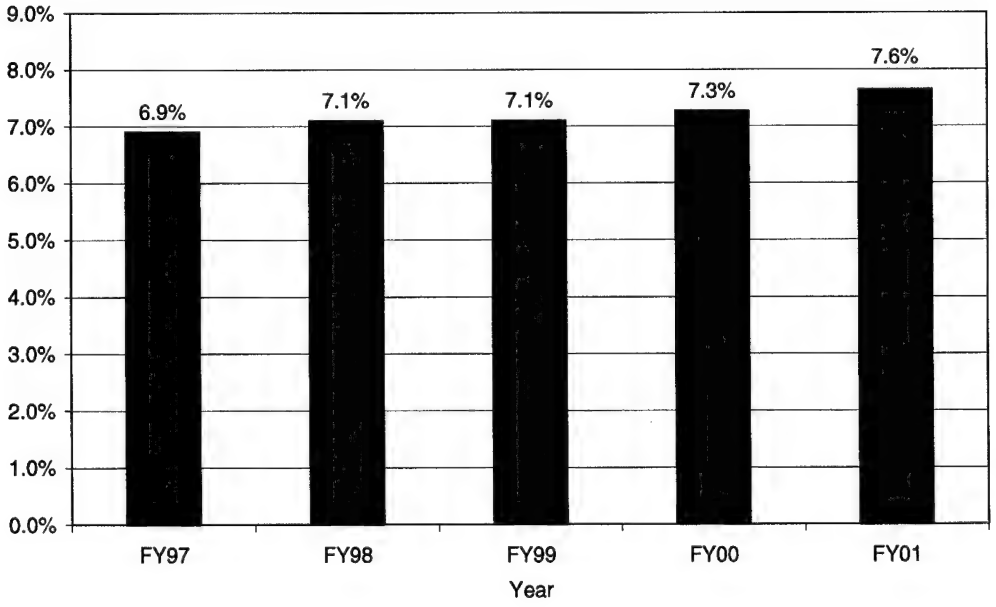
Figure 2-3. Distribution of Active Duty Enlisted Maintainers by Skill Category, FY01



Female Representation

Women in the active duty enlisted maintainer workforce comprised 7.6 percent of the total number of maintainers in FY01. Female non-maintainers totaled 18.3 percent. The percentage of female maintainers increased less than 1 percentage point in the last 5 years (as depicted in Figure 2-4); however, female non-maintainers experienced a 1.3 percentage point increase during the same period.

Figure 2-4. Percentage of Women in Active Duty Enlisted Maintainer Population



Minority Representation

In FY01, 32 percent of the active duty enlisted maintainer workforce was classified as a member of a minority population. Non-maintainer minority representation was 42 percent for the same timeframe. This 32 percent presented in Table 2-9 is an increase of more than 3 percentage points during the period of this study. Non-maintainers increased at about the same pace (up 3.5 percentage points).

Table 2-9. Percentage of Minorities in the Active Duty Enlisted Maintainer Workforce

		Minorities				
	Rank	1997	1998	1999	2000	2001
Active duty	Enlisted	28.7%	29.4%	30.2%	31.1%	32.0%

ACTIVE DUTY COMMISSIONED OFFICER MAINTAINERS

A total of 9,700 commissioned officer maintainers were on active duty in FY01. This number is down from 10,300 in FY97, a 5.4 percent decrease over the 5-year period (as seen in Table 2-10).[8] The percentage of maintainer officers compared to the total DoD officers has remained relatively constant over the 5-year period, though. During this timeframe, the largest decrease in the active duty officer population was in the Army, with a 16 percent decrease. The officer population decreased at a slightly greater rate than the enlisted population (–3.7 percent for active duty enlisted maintainers versus –5.8 percent for officers in the same segment).

[8] For the purpose of this study, we have separated commissioned officers and warrant officers. Although most warrant officers (in the ranks W2 through W5) hold commissions, we use the terms commissioned officers and officers interchangeably. We refer to all warrant officers (whether with warrant or commission) as warrant officers.

Table 2-10. Number of Active Duty Commissioned Officer Maintainers by Service (in thousands)

Service	FY97	FY98	FY99	FY00	FY01	Percentage change FY97 - FY01
Maintainers						
Army	4.5	4.3	4.1	3.9	3.8	-16.0
Navy	3.1	3.0	3.1	3.2	3.3	6.4
Marine Corps	0.5	0.5	0.5	0.4	0.5	2.8
Air Force	2.2	2.1	2.1	2.1	2.1	-3.8
Total	10.3	9.9	9.7	9.6	9.7	-5.8
Total active duty commissioned officers	212.4	208.2	204.6	201.9	200.9	-5.4
Maintainers as percent of total	4.8	4.8	4.8	4.7	4.8	0.0

Note: Totals reflect rounding. Percentage calculations based on actual data.

Age

The average age of active duty officer maintainers in FY01 was 36.6 years. The average age for non-maintainers was 34.7 years. The age of the maintainers remained rather constant during the study period, as seen in Table 2-11.

Table 2-11. Average Age of Active Duty Officer Maintainers

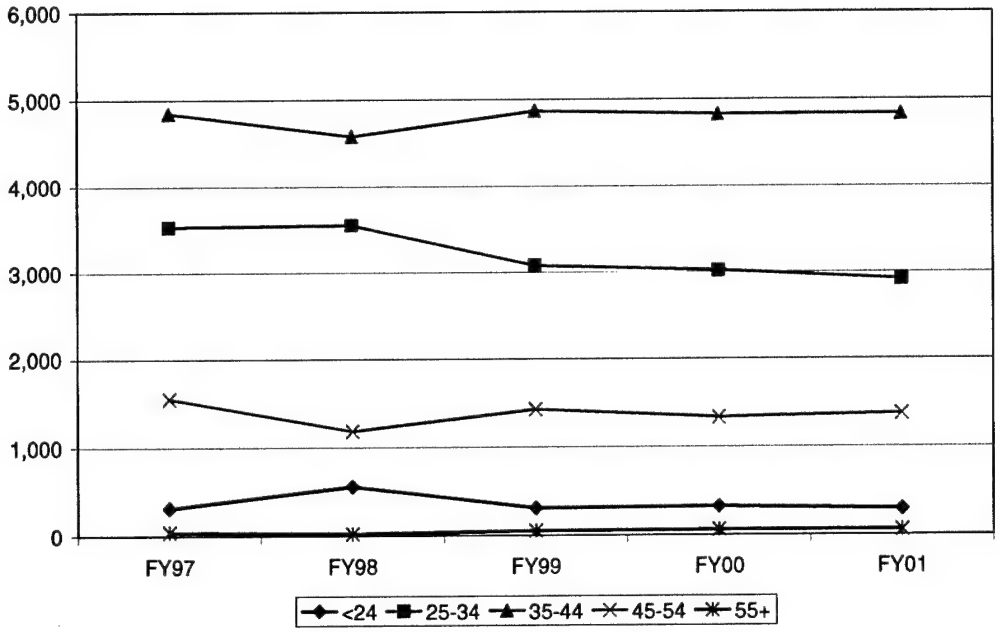
		Age (in years)					
	Rank	1997	1998	1999	2000	2001	Percentage change
Active duty	Officer	36.2	36.3	36.5	36.6	36.6	1.0%

Note: Totals reflect rounding. Percentage calculations based on actual data.

The largest decrease in the number of officer maintainers was in the 25–34 age group, with a 17.5 percent decrease (as depicted in Figure 2-5). One likely reason for this decrease is the increase in commissioning from the enlisted ranks (e.g., Boot Strap, Warrant Officer, and Limited Duty Officer programs).[9] The decline in the 35–44 age bracket was only 0.3 percent. The only age bracket to increase its ranks was for those over 55, but total numbers are negligible.

[9] We discuss the effect of the increase in the number of limited duty officers on educational levels in a later section.

Figure 2-5. Number of Active Duty Officer Maintainers by Age Group



Years of Service

The average years of service for active duty officer maintainers was 15.2 years in FY01, compared with 11.6 years for non-maintainers. For maintainers, this is a slight increase from the 14.8 years in FY97, as shown in Table 2-12. This increase corresponds to the slight rise in the average age for this group of maintainers.

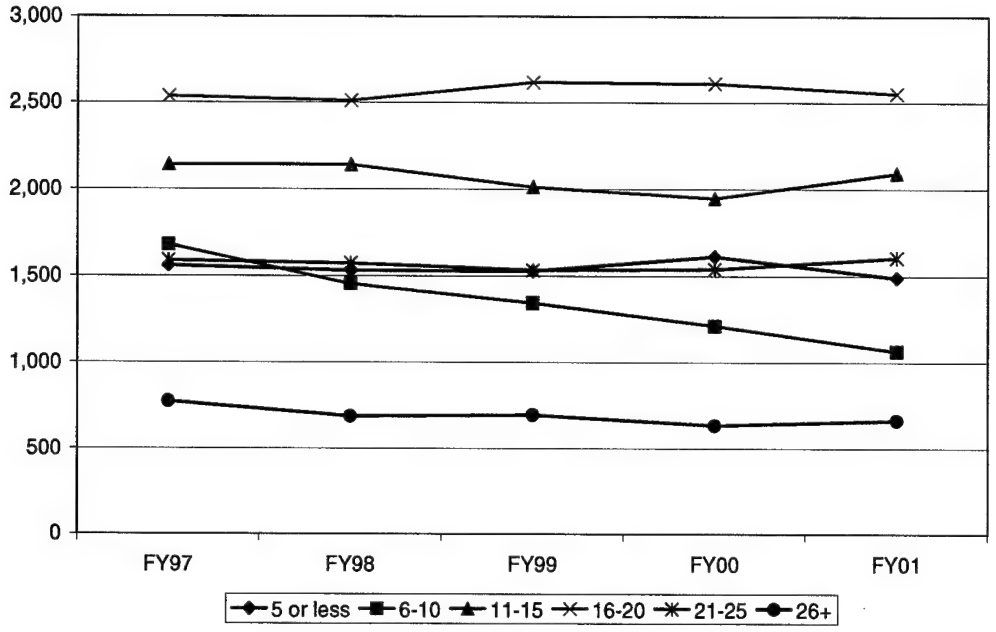
Table 2-12. Average Years of Service for Active Duty Officer Maintainers

		Years of service					
	Rank	1997	1998	1999	2000	2001	Percentage change
Active duty	Officer	14.8	14.8	14.9	14.9	15.2	2.7%

Note: Totals reflect rounding. Percentage calculations based on actual data.

As presented in Figure 2-6, there was a large decline in active duty officer maintainers with only 6–10 YOS (almost 37 percent) over the 5-year period. There were very modest gains in the number of years of service for the 16–20 and 21–25 year groups (0.6 percent and 1 percent, respectively).

Figure 2-6. Distribution of Years of Service for Active Duty Officer Maintainers



Retirement Eligibility

The percentage of active duty officer maintainers eligible to retire in FY01 was 29.1 percent, compared with 16.4 percent for eligible non-maintainers. This higher percentage for maintainers corresponds to the fact that maintainers are generally a little older and have more years of service than non-maintainers. There was a small rise (1.1 percentage points) over the 5-year period for the active duty officer maintainers eligible to retire (portrayed in Table 2-13).

Table 2-13. Percentage of Active Duty Officer Maintainers Eligible for Retirement

		Retirement eligible				
	Rank	1997	1998	1999	2000	2001
Active duty	Warrant officer	43.6%	42.7%	40.8%	37.7%	38.0%

Education

The percentage of college graduates in the active duty officer maintainer workforce was 80.4 percent in FY01.[10] This is down from 86.9 percent in FY97. There was a decrease in the number of the active duty officer maintainers with just high school diplomas (–6.4 percentage points) and in the number of college graduates (–7.4 percentage points); however, there was a corresponding increase (13 percentage points) in the number of maintainers with some college and in the number

[10] The 80.4 percent combines the college graduate and postgraduate work levels seen in Table 2-14.

with postgraduate work (2.6 percentage points). See Table 2-14 for overall educational attainment numbers.

Table 2-14. Percentage of Active Duty Commissioned Officer Maintainers by Educational Level

Level	FY97	FY98	FY99	FY00	FY01
High school graduate	10.0	10.7	12.5	2.9	3.6
Some college	3.0	2.9	3.0	13.5	16.0
College graduate	51.8	51.0	48.3	48.5	44.4
Postgraduate work	35.1	35.4	36.1	35.1	36.0

Note: Due to rounding, columns may not total 100 percent; unknowns not included in calculations.

The steady decrease in the percentage of active duty officer maintainers who are college graduates can be attributed to an increase in the number of limited duty officers (LDOs) in the Navy. In FY97, LDOs comprised 63 percent of the active duty Navy officer maintainer category. By FY01, that percentage increased to 72 percent LDO. Table 2-15 reveals that, although there were more LDOs in FY01 than 5 years before, their educational level declined.

Table 2-15. Percentage of Navy Limited Duty Officer Maintainers by Educational Level

	FY97 (63% LDO)	FY01 (72% LDO)
College graduate plus postgraduate work	30.7%	27.2%

Skills

In FY01, the majority of the active duty officer maintainers (3,312) worked in the aviation maintenance category, as seen in Table 2-16. There were some rather significant changes in the skill composition of the active duty officer maintainer force over the 5 years; however, the overall decrease in the total number of officers is relatively small (5.8 percent).

Table 2-16. Number of Active Duty Commissioned Officer Maintainers by Skill Category

Category	FY97	FY98	FY99	FY00	FY01
Aviation maintenance and allied	3,522	3,369	3,399	3,272	3,312
Other	2,415	2,366	2,242	2,052	1,959
Electrical/electronic	2,170	1,979	1,761	1,555	1,395
Ordnance	462	547	654	1,134	1,359
Ship machinery	785	751	793	811	885
Communications and radar	414	397	411	416	433
Missile maintenance	506	484	466	319	335
Automotive and allied		3	6		
Ship construction and maintenance					
Total	10,274	9,896	9,732	9,559	9,678

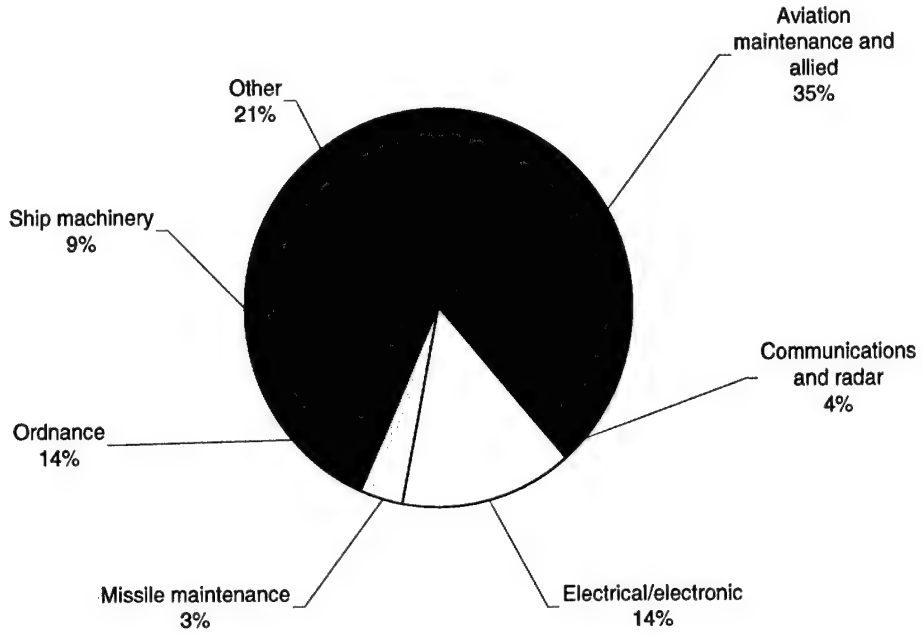
The changes in the composition of the officer maintainer workforce is primarily due to a recategorization of several career fields, the largest example being the ordnance officer category, which shows a 194 percent increase from FY97 to FY01. During this time there was a migration of more than 500 tank/automobile maintainers from the "other" category to the "ordnance general" category.[11] Also during this period, the Air Force Specialty Code 21M saw a migration of 200 people from "space/missile maintenance" categorization into the "ordnance" category.[12]

Figure 2-7 portrays the current distribution of active duty maintenance officers by skill category, with the largest portion of officers working in the aviation maintenance arena.

[11] Army Military Occupational Specialty (MOS) 91B was previously classified as DoD Occupation Code (DoDOC) 8C Transportation and labeled in the DMDC database as "Other". Reclassification actions moved these specialists into the 91A MOS (DoDOC 4E Ordnance).

[12] AFSC 21M was previously DoDOC 4F, Space/Missile Maintenance. This specialty involved a reclassification of these maintainers in Ordnance (DoDOC 4E).

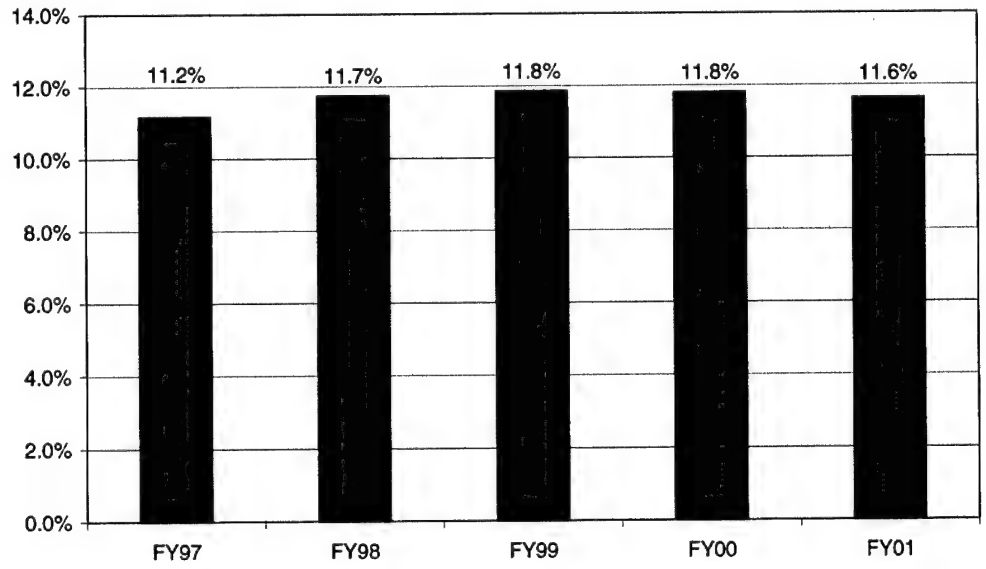
Figure 2-7. Distribution of Active Duty Officer Maintainers by Skill Category, FY01



Female Representation

In FY01, the female representation of the active duty maintenance officer workforce was 11.6 percent. This compared to 15.5 percent representation within the non-maintainer workforce. The percentage of female maintenance officers declined somewhat since FY99, but remained above the FY97 level of 11.2 percent of the maintenance officer population (see Figure 2-8).

Figure 2-8. Percentage of Women in Active Duty Officer Maintainer Population



Although the percentage of female active duty maintenance officers increased by 0.4 percentage points, the growth in the percentage of non-maintenance female officers was higher (1.2 percentage points).

Minority Representation

Minorities comprise 21.2 percent of the active duty officer maintainer workforce (see Table 2-17), compared to 18.1 percent for active duty non-maintainer officers. These figures represent a 2.4 and 2.9 percentage point increase between FY97 and FY01, for maintainer and non-maintainer, respectively.

Table 2-17. Percentage of Minorities in the Active Duty Officer Maintainer Workforce

		Minorities				
	Rank	1997	1998	1999	2000	2001
Active duty	Officer	18.8%	19.6%	20.1%	21.3%	21.2%

ACTIVE DUTY WARRANT OFFICER MAINTAINERS

The number of active duty warrant officer maintainers has declined less than the enlisted and commissioned officer forces (–3.7 percent as compared to 4.1 percent and 5.8 percent, respectively). In FY01 the active duty warrant officer maintainers constituted about 27 percent of the total number of active duty warrant officers. The percentage of maintainer warrant officers, when compared to the total number, has remained rather constant over the 5 study years, as seen in Table 2-18.

Table 2-18. Number of Active Duty Warrant Officer Maintainers by Service (in thousands)

Service	FY97	FY98	FY99	FY00	FY01	Percentage change FY97 - FY01
Maintainers						
Army	3	3	3	3	3	-6.0
Navy	1	1	1	1	1	-2.6
Marine Corps	1	1	1	1	1	4.8
Air Force						
Total	4	4	4	4	4	-3.7
Total active duty warrant officers	15	15	15	15	15	-2.4
Maintainers as percent of total	29	28	27	29	29	-0.4

Note: Totals reflect rounding. Percentage calculations based on actual data.

Age

The average age of active duty warrant officer maintainers was 39 in FY01, compared to 36.8 years for non-maintainers. Both maintainer and non-maintainer average ages remained rather constant during the 5 study years. Average ages of maintainers are presented in Table 2-19.

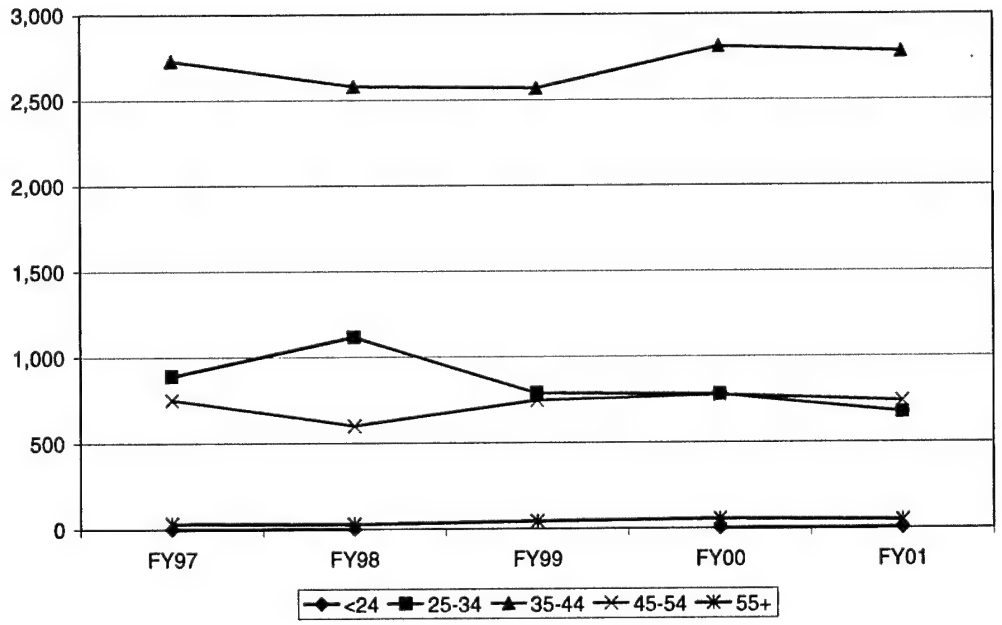
Table 2-19. Average Age of Active Duty Warrant Officer Maintainers

		Age (in years)					
	Rank	1997	1998	1999	2000	2001	Percentage change
Active duty	Warrant officer	38.7	38.8	39.0	39.1	39.0	0.9%

Note: Totals reflect rounding. Percentage calculations based on actual data.

As presented in Figure 2-9, there was a large decline of warrant officer maintainers in the 25–34 age bracket (24 percent) with a modest gain (2 percent) in the 35–44 age bracket.

Figure 2-9. Number of Active Duty Warrant Officer Maintainers by Age Group



Years of Service

The average YOS of active duty warrant officer maintainers was 19.1 years, compared to 16.3 years for non-maintainers. For maintainers, this is less than a 1 percent increase from FY97 to FY01. The average YOS is shown in Table 2-20.

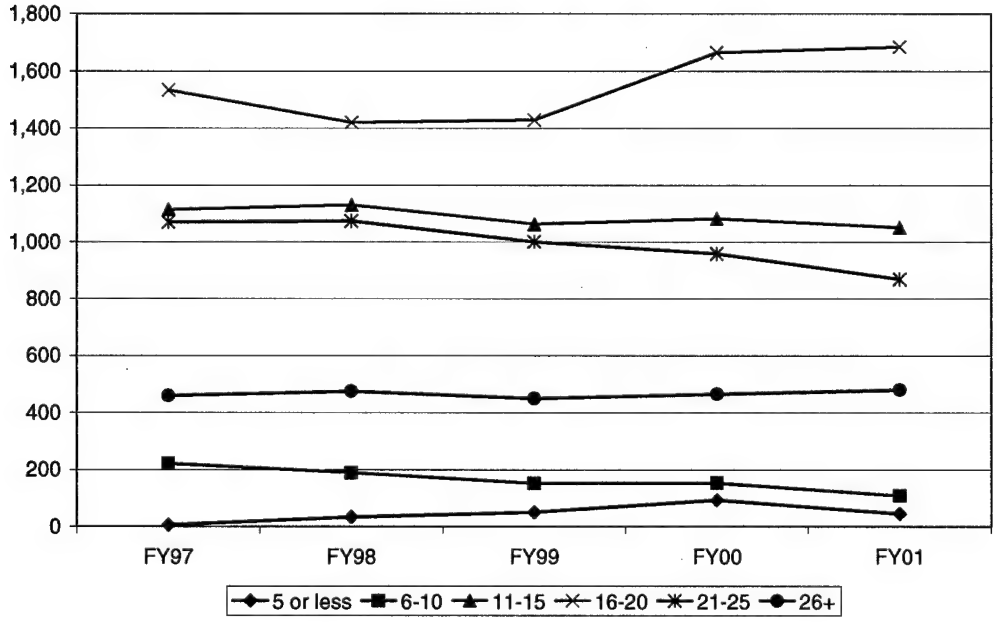
Table 2-20. Average Years of Service for Active Duty Warrant Officer Maintainers

		Years of service					
	Rank	1997	1998	1999	2000	2001	Percentage change
Active duty	Warrant officer	18.9	18.8	18.8	18.7	19.1	0.9%

Note: Totals reflect rounding. Percentage calculations based on actual data.

The largest portion of warrant officer maintainers was in the 16–20 YOS group; this group experienced an increase of almost 10 percent from FY97 to FY01. There were also considerable increases in the 5 or less YOS bracket (800 percent but with negligible numbers) and in the more than 26 YOS bracket (4.6 percent). The other YOS brackets (6–10, 11–15, and 21–25) saw decreases of almost 51 percent, 6 percent, and 19 percent, respectively. Figure 2-10 depicts these numbers.

Figure 2-10. Distribution of Years of Service for Active Duty Warrant Officer Maintainers



Retirement Eligibility

In FY01, 38 percent of the active duty warrant officer maintainer workforce was eligible to retire, compared to 24.8 percent of the non-maintainer workforce. For maintainers, this is a decrease of almost 6 percentage points over the 5-year study (see Table 2-21).

Table 2-21. Percentage of Active Duty Warrant Officer Maintainers Eligible for Retirement

		Retirement eligible				
	Rank	1997	1998	1999	2000	2001
Active duty	Warrant officer	43.6%	42.7%	40.8%	37.7%	38.0%

Education

In FY01, 25 percent of the active duty warrant officer workforce had college degrees, up from 19.9 percent in FY97. These percentages are indicated in Table 2-22. There was a corresponding decrease in the percentage of warrant officers with high school diplomas (80.1 percent in FY97 to 75 percent in FY01).

Table 2-22. Percentage of Active Duty Warrant Officer Maintainers by Educational Level

Level	FY97	FY98	FY99	FY00	FY01
High school graduate	45.8	46.6	48.1	14.6	31.4
Some college	34.3	32.4	29.3	60.6	43.6
College graduate	16.2	16.5	17.5	19.1	17.9
Postgraduate work	3.7	4.4	5.2	5.6	7.1

Note: Due to rounding, columns may not total 100 percent; unknowns not included in calculations.

Skills

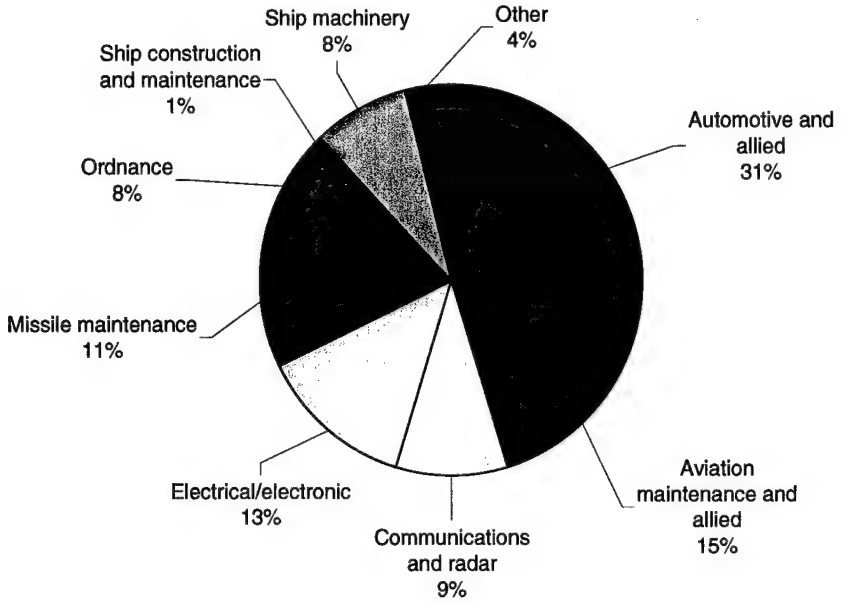
Even though the overall decrease in the number of warrant officer maintainers was small (–3.7 percent), some skill categories experienced significant changes. Within the various skill categories, there were adjustments and recategorizations that produced a 42.3 percent decrease in ship construction and maintenance maintainers, and a 19 percent decrease in electrical/electronic maintainers (see Table 2-23). Categories that increased were aviation maintenance (8.6 percent) and missile maintenance (13.4 percent).

Table 2-23. Number of Active Duty Warrant Officer Maintainers by Skill Category

Category	FY97	FY98	FY99	FY00	FY01
Automotive and allied	1,329	1,335	1,352	1,321	1,302
Aviation maintenance and allied	572	589	600	613	621
Electrical/electronic	679	686	459	715	550
Missile maintenance	426	503	480	478	483
Communications and radar	437	417	404	417	402
Ship machinery	351	335	332	338	340
Ordnance	328	330	333	334	323
Other	181	41	120	150	161
Ship construction and maintenance	97	83	62	48	56
Total	4,400	4,319	4,142	4,414	4,238

The distribution of warrant officer maintainers by skill category is depicted in Figure 2-11. The majority of warrant officer maintainers work in the automotive category, followed by those in aviation and electrical/electronic maintenance.

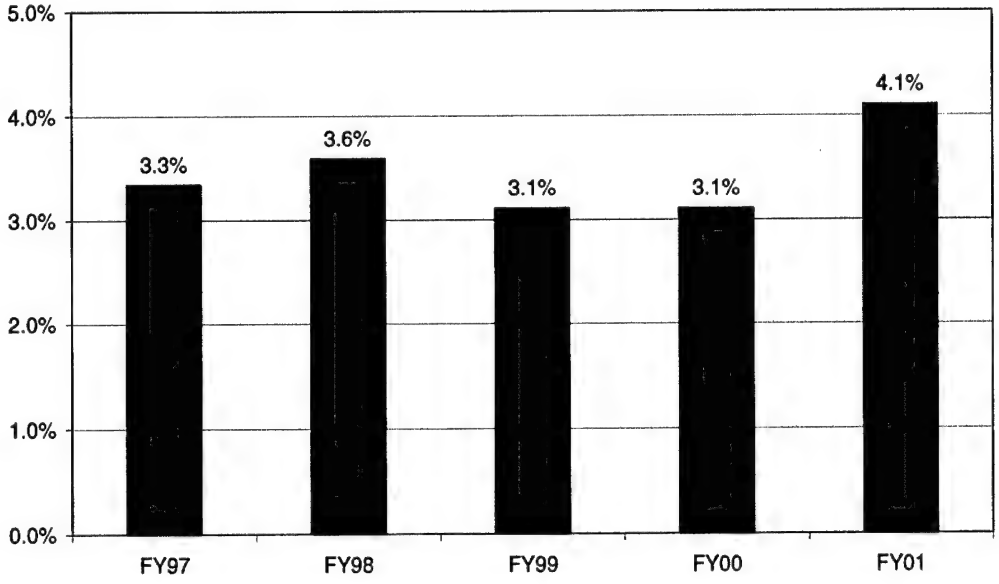
Figure 2-11. Distribution of Active Duty Warrant Officers by Skill Category, FY01



Female Representation

Female representation in the active duty warrant officer maintainer workforce was 4.1 percent in FY01. This compares with 7.7 percent female representation for non-maintainers. The percentage point growth from FY97 to FY01 for female maintainers and non-maintainers was 0.8 and 0.4 percentage points, respectively. The percentage growth for female maintainers is depicted in Figure 2-12.

Figure 2-12. Percentage of Women in Active Duty Warrant Officer Maintainer Population



Minority Representation

Minority representation in the active duty warrant officer maintainer workforce was 34.2 percent in FY01, compared to 24.1 percent in the non-maintainer workforce. For maintainers, this equated to a 3.7 percentage point increase during the study period (shown in Table 2-24), compared to a 3.2 percentage point increase for non-maintainers.

Table 2-24. Percentage of Minorities in the Active Duty Warrant Officer Maintainer Workforce

		Minorities				
	Rank	1997	1998	1999	2000	2001
Active duty	Warrant officer	30.5%	31.7%	31.8%	32.4%	34.2%

Chapter 3
Selected Reserve Maintainers

In FY01, there were more than 867,000 selected reserve members in DoD. Of these, more than 192,000—or 22.2 percent—were maintainers. This was 5 percent fewer than in FY97. Table 3-1 shows the number of selected reserve maintainers by rank and with percentage change.

Table 3-1. Number of Selected Reserve Maintainers

Segment	FY97	FY98	FY99	FY00	FY01	Percentage change FY97 - FY01
Enlisted	193.5	189.3	185.9	183.4	184.3	-4.80
Commissioned	6.6	6.5	6.6	6.1	5.6	-15.91
Warrants	2.5	2.6	2.7	2.7	2.8	9.54
Total	202.7	198.4	195.2	192.2	192.6	-4.99

Note: Totals reflect rounding. Percentage calculations based on actual data.

The selected reserve maintainer workforce saw the most significant changes of all the segments within DoD between FY97 and FY01. Reductions of almost 16 percent in the officer segment were somewhat offset by increases of more than 9.5 percent in the warrant officer segment. The Army Guard and Army Reserve decreased their maintenance officer workforce by 22.1 percent and 12.1 percent, respectively, while increasing their maintainer warrant officer force by 11.5 percent and 21.7 percent. The other reserve components reduced their maintenance officer ranks by only 10.3 percent.

The Navy and Marine Corps Reserves decreased their maintenance warrant officer strength by about 30 percent, but gains in the Army reserve forces led to an overall warrant officer maintainer program growth of 9.5 percent. The growth in the Army Guard and Reserve programs affected the decrease in the age, YOS, and retirement eligible categories of the selected reserve warrant officer maintainers—the only segment to have declines in all three categories.

Selected Reserve Enlisted Maintainers

The Army Guard and Reserve maintainer forces comprise 54.6 percent of the total selected reserve maintainer force. The Air Force, Navy, and Marine Corps selected reserve maintainers constitute 30.6 percent, 11 percent, and 3.7 percent of the total selected reserve (SR) maintainers, respectively. As portrayed in Table 3-2, the total change from FY97 to FY01 for this population has been a 4.8 percent decrease, as compared to a 4.1 percent decrease for active duty

enlisted maintainers for the same time period. The largest change was in the Navy, which experienced a 16 percent decrease. This was offset somewhat across the entire reserve component with increases of 7.7 percent in the Army Reserve and 4.8 percent in the Marine Corps Reserve.

Table 3-2. Number of Selected Reserve Enlisted Maintainers by Service (in thousands)

Service	FY97	FY98	FY99	FY00	FY01	Percentage change FY97 - FY01
Maintainers						
Army Guard	75.7	73.1	71.8	70.7	69.7	-8.0
Air Force Guard	40.5	40.5	39.4	39.1	39.6	-2.3
Navy	24.5	24.3	22.9	20.8	20.5	-16.0
Army Reserve	26.8	25.4	26.2	27.4	28.9	7.7
Air Force Reserve	19.3	19.1	18.6	18.4	18.5	-4.2
Marine Corps	6.7	6.9	6.9	6.9	7.0	4.8
Total	193.5	189.3	185.9	183.4	184.3	-4.8
Total selected reserve enlisted	763.3	745.4	735.0	733.1	736.6	-3.5
Maintainers as percent of total	25.4	25.4	25.3	25.0	25.0	-0.3

Age

The average age of selected reserve enlisted maintainers was 33.5 in FY01. This compares with 32.1 for non-maintainers. Both maintainer and non-maintainer ages remained very stable over the 5 years of this study (depicted for maintainers in Table 3-3).

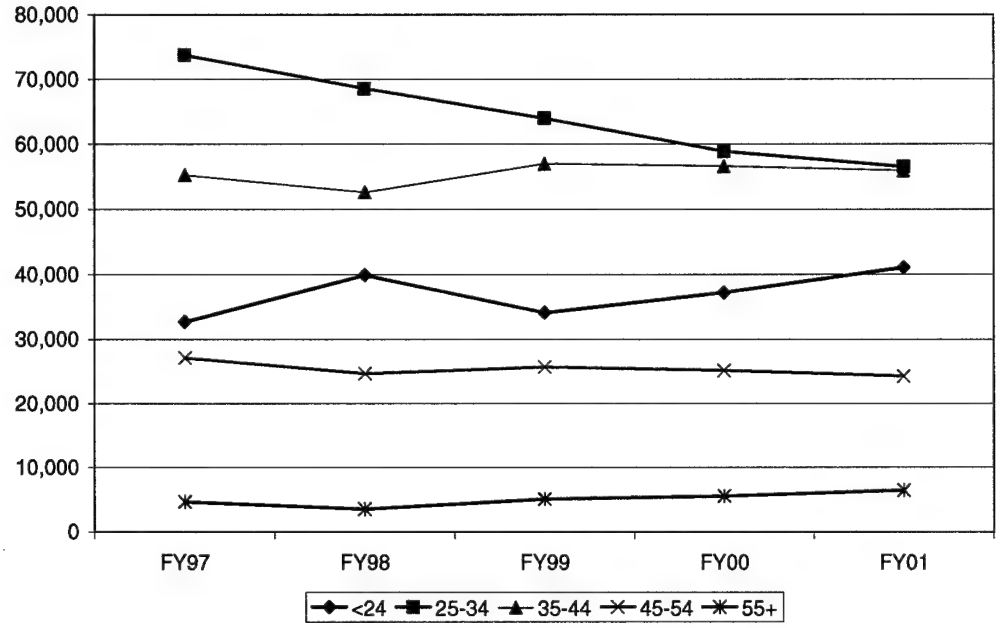
Table 3-3. Average Age of Selected Reserve Enlisted Maintainers

		Age (in years)					
	Rank	1997	1998	1999	2000	2001	Percentage change
Selected reserve	Enlisted	33.5	33.6	33.7	33.7	33.5	0.0%

Note: Totals reflect rounding. Percentage calculations based on actual data.

Figure 3-1 presents changes within the various age groups of the selected reserve enlisted maintainers during the last 5 years. With the exception of modest gains (1 percent) in the 35–44 bracket, there were significant losses in the most experienced areas (23 percent decline for the 25–34 bracket and 11 percent for the 45–54 group). There were substantial corresponding increases in the outer extreme age groups (those under 24 increased 26 percent, and for those maintainers 55 and older, a 38 percent rise).

Figure 3-1. Number of Selected Reserve Enlisted Maintainers by Age Group



Years of Service

The average years of service for the selected reserve enlisted maintainers was 14 years in FY01 (see Table 3-4), compared to 12.6 years for non-maintainers. For maintainers, this represents a 13.8 percent increase over the average YOS in FY97.

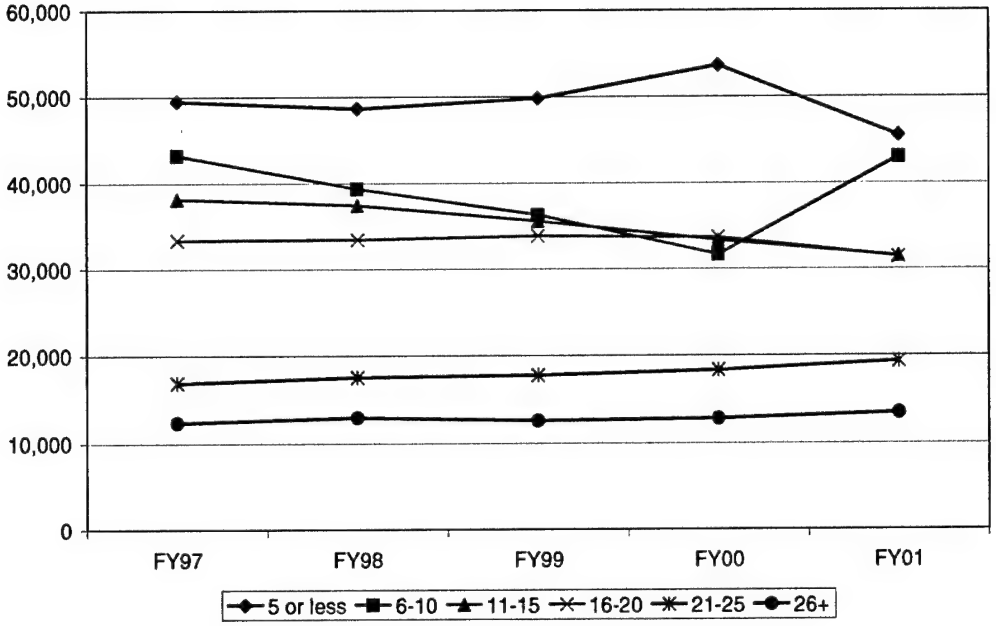
Table 3-4. Average Years of Service for Selected Reserve Enlisted Maintainers

		Years of service					
	Rank	1997	1998	1999	2000	2001	Percentage change
Selected reserve	Enlisted	12.3	12.5	12.6	13.1	14.0	13.8%

Note: Totals reflect rounding. Percentage calculations based on actual data.

Portrayed in Figure 3-2, selected reserve enlisted maintainers saw increases in the average YOS for the two longest YOS periods (21–25 with 14 percent and more than 26 YOS with almost 9 percent). Although there was a sharp increase in the number of maintainers with 6–10 YOS between FY00 and FY01, there was an overall decline for the 5-year period of slightly less than 1 percent. The other three brackets showed declines, with the 11–15 YOS group declining the most (almost 18 percent).

Figure 3-2. Distribution of Years of Service for Selected Reserve Enlisted Maintainers



Retirement Eligibility

In FY01, 21.3 percent of the selected reserve enlisted maintainers were eligible to retire. This compares with 16.6 percent for non-maintainers. This is a 3.2 percentage point increase for maintainers from FY97 to FY01, compared to a 1.8 point increase for non-maintainers. Percentages for maintainers are shown in Table 3-5.

Table 3-5. Percentage of Selected Reserve Enlisted Maintainers Eligible for Retirement

		Retirement eligible				
	Rank	1997	1998	1999	2000	2001
Selected reserve	Enlisted	18.2%	18.9%	19.4%	20.7%	21.3%

AFQT Score

In FY01, the percentage of selected reserve enlisted maintainers who scored 65 percent or higher on the AFQT was 42.7 percent. As mentioned in Chapter 2, the data on AFQT scores contained many unknown scores, roughly 15 percent for the reserve forces. The 42.7 percent figure excludes the unknown scores. Table 3-6 presents the percentages from FY97 to FY01.

Table 3-6. Percentage of Selected Reserve Enlisted Maintainers with Passing AFQT Scores

		AFQT				
	Rank	1997	1998	1999	2000	2001
Selected reserve (w/o unknowns)	Enlisted	43.4%	43.7%	43.8%	42.5%	42.7%

Education

The percentage of high school graduates among the selected reserve enlisted maintainers was 90.3 percent in FY01. This percentage is down somewhat from 91.4 percent in FY97. However, there was a sharp increase in maintainers with some college experience, as seen in Table 3-7. The rise in college achievement corresponds to earlier statements about the increasing importance of educational achievement in today's society.

Table 3-7. Percentage of Selected Reserve Enlisted Maintainers by Educational Level

Level	FY97	FY98	FY99	FY00	FY01
Some high school	4.0	4.1	4.7	4.9	4.9
High school graduate	83.8	79.1	78.3	62.5	68.3
Some college	7.6	11.9	12.0	28.0	22.0
College graduate	4.6	4.9	4.9	4.6	4.8

Note: Due to rounding, columns may not total 100 percent; unknowns not included in calculations.

Skills

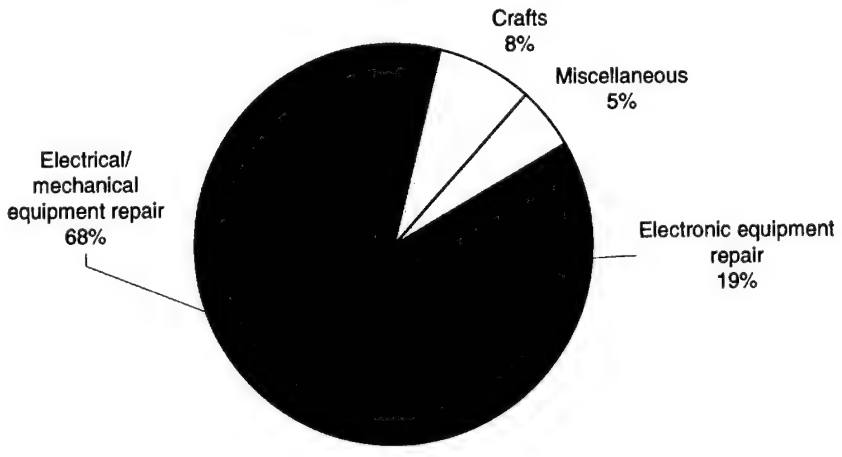
All selected reserve skill categories decreased during the study's 5 years, with an 11.4 percent decrease in electronic equipment repair workers, a 5.8 percent decrease in electrical/mechanical equipment repairers, and a 4.7 percent decrease in crafts workers, as depicted in Table 3-8. Within the three categories, there are various increases and decreases, but an overall 4.8 percent decrease over the 5 years studied.

Table 3-8. Number of Selected Reserve Enlisted Maintainers by Skill Category

Category	Subcategory	FY97	FY98	FY99	FY00	FY01
Electrical/ mechanical equipment repair	Automotive	50,979	50,023	49,676	49,256	49,473
	Aircraft and aircraft related	47,854	46,525	45,229	44,216	44,208
	Armament and munitions	13,778	13,174	13,001	12,943	13,090
	Power generating equipment	7,795	7,333	7,117	6,995	7,094
	Wire communications	6,400	6,099	5,835	5,713	5,614
	Shipboard propulsion	3,843	3,852	3,588	3,500	3,485
	Other mechanical and electrical equipment	1,907	1,899	1,936	2,142	2,206
	Precision equipment	246	238	235	163	151
	Missile mechanical and electrical	287	191	157	116	95
	Subtotal	133,089	129,334	126,774	125,044	125,416
Electronic equipment repair	Radio/radar	30,941	29,422	28,594	27,669	27,157
	Other electronic equipment	3,060	2,999	2,882	2,793	2,761
	Missile guidance, control and checkout	2,015	1,964	1,957	1,869	1,858
	ADP Computers	1,367	1,439	1,361	1,357	1,757
	Teletype and cryptographic equipment	1,529	1,719	1,673	1,532	1,002
	Sonar equipment	560	544	539	474	475
	Fire control electronic systems (nonmissile)	354	369	354	316	295
	Nuclear weapons equipment	45	37	26	23	34
	Subtotal	39,871	38,493	37,386	36,033	35,339
Crafts	Other crafts	8,133	8,060	7,980	7,955	8,456
	Metalworking	5,220	4,365	4,331	4,323	4,327
	Fabric, leather, and rubber	1,830	1,744	1,743	1,689	1,681
	Subtotal	15,183	14,169	14,054	13,967	14,464
Miscellaneous		5,398	7,318	7,636	8,324	9,031
Total		193,541	189,314	185,850	183,368	184,250

The largest segment by skill category of the selected reserve enlisted maintainers is the electrical/mechanical equipment repair (68 percent), as shown in Figure 3-3. The next largest category is electronic equipment repair with 19 percent.

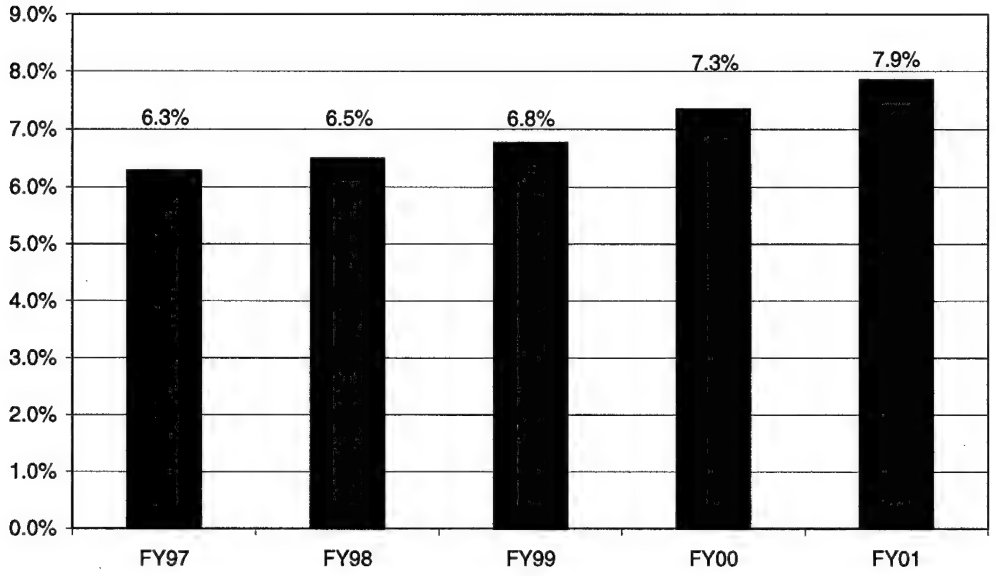
Figure 3-3. Distribution of Selected Reserve Enlisted Maintainers by Skill Category, FY01



Female Representation

In FY01, the selected reserve enlisted maintainer population was 7.9 percent female. This compares to 20 percent female representation for non-maintainers. The maintenance percentage was 6.3 percent in FY97, or a 1.6 percentage point increase during the 5-year period. Figure 3-4 portrays this increase.

Figure 3-4. Percentage of Women in Selected Reserve Enlisted Maintainer Population



Minority Representation

Minority representation in the selected reserve enlisted maintainer workforce was 22 percent in FY01. (See Table 3-9). The non-maintainer percentage was 28.4 percent for the same period. Both maintainer and non-maintainer workforces increased 1.4 percentage points from FY97 to FY01.

Table 3-9. Percentage of Minorities in Selected Reserve Maintainer Workforce

		Minorities				
	Rank	1997	1998	1999	2000	2001
Selected reserve	Enlisted	20.6%	21.0%	21.1%	21.5%	22.0%

SELECTED RESERVE OFFICER MAINTAINERS

The total number of selected reserve officer maintainers declined by 16.1 percent from FY97 to FY01, compared to a 5.7 percent decrease of all SR officers. These figures are portrayed in Table 3-10. The largest decrease (22.1 percent) was in the

Army Guard. In comparison, the active duty officer maintainer force saw a 7.9 percent reduction over the same period.

Table 3-10. Number of Selected Reserve Commissioned Officer Maintainers by Service (in thousands)

Service	FY97	FY98	FY99	FY00	FY01	Percentage change FY97 - FY01
Maintainers						
Army Guard	2.7	2.6	2.6	2.5	2.1	-22.1
Air Guard	0.5	0.5	0.5	0.5	0.4	-13.8
Navy	0.7	0.7	0.6	0.6	0.6	-8.8
Army Reserve	2.2	2.3	2.5	2.1	2.0	-12.1
Air Force Reserve	0.4	0.4	0.4	0.4	0.4	-10.3
Marine Corps	0.1	0.1	0.1	0.0	0.0	-12.7
Total	6.6	6.5	6.6	6.1	5.6	-15.9
Total Selected Reserve commissioned officers	127.0	124.3	124.3	120.9	119.8	-5.7
Maintainers as percent of total	5.2	5.2	5.3	5.1	4.7	-0.6

Note: Totals reflect rounding. Percentage calculations based on actual data.

Age

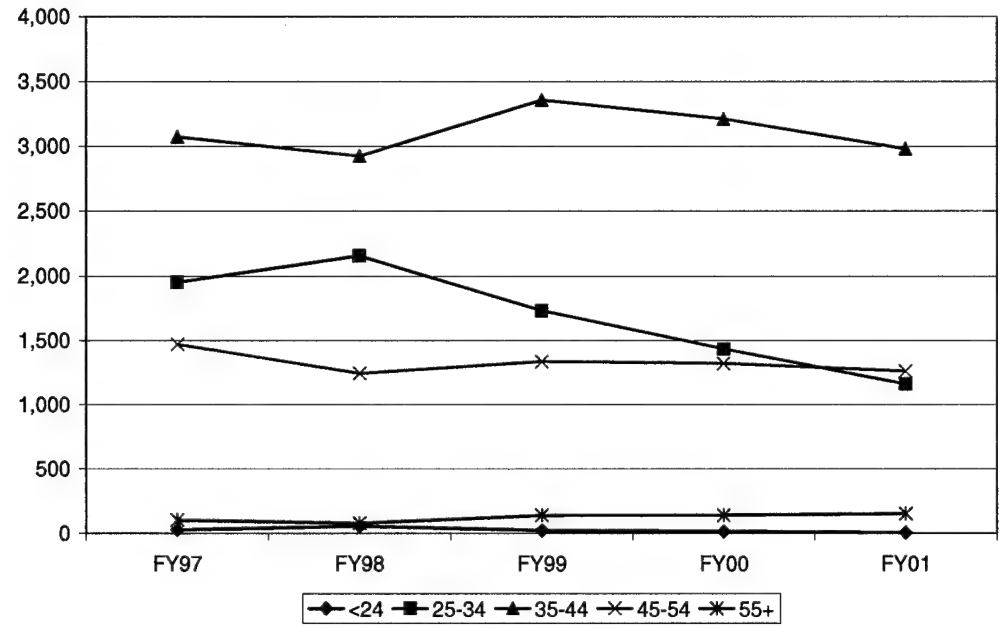
The average age of selected reserve officer maintainers in FY01 was 39.5 years, compared to 40.6 years for non-maintainers. For maintainers, this average age is a 3.1 percent increase over FY97, as depicted in Table 3-11.

Table 3-11. Average Age of Selected Reserve Officer Maintainers

		Age (in years)					
	Rank	1997	1998	1999	2000	2001	Percentage change
Selected reserve	Officer	38.3	38.4	38.6	39.0	39.5	3.1%

As seen in Figure 3-5, the SR officer maintainers had losses in four of the five age categories, with the largest losses in the under-24 and 25–34 age groups. The 55 and older age group had an increase of almost 50 percent, but the overall numbers were relatively small (153 total in FY01).

Figure 3-5. Number of Selected Reserve Officer Maintainers by Age Groups



Years of Service

The average YOS for selected reserve officer maintainers was 17.9 years, compared with 17.2 years for non-maintainers. For maintainers, there was a 7.6 percent increase over the timeframe of this study, seen in Table 3-12.

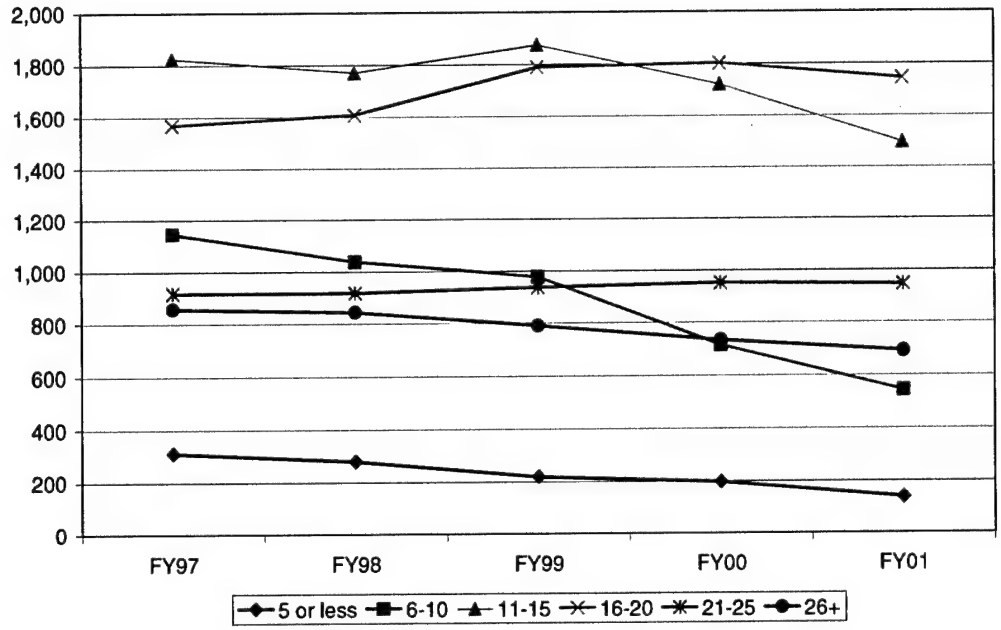
Table 3-12. Average Years of Service for Selected Reserve Officer Maintainers

		Years of service					
	Rank	1997	1998	1999	2000	2001	Percentage change
Selected reserve	Officer	16.6	16.8	16.9	17.4	17.9	7.6%

Note: Totals reflect rounding. Percentage calculations based on actual data.

As presented in Figure 3-6, the 16–20 and 21–25 year groups saw gains of just over 11 percent and 3 percent, respectively. All other year groups saw rather substantial declines over the 5-year timeframe. The largest declines were in the 5 or less and 6–10 YOS groups.

Figure 3-6. Distribution of Average Years of Service for Selected Reserve Officer Maintainers



Retirement Eligibility

In FY01, 35.6 percent of the selected reserve officer maintainers were eligible to retire. That percentage compares with 31.8 percent for non-maintainers during the same period. Over the 5 years of our study, this represents an increase of 4.2 percentage points, as seen in Table 3-13.

Table 3-13. Percentage of Selected Reserve Officer Maintainers Eligible for Retirement

		Retirement eligible				
	Rank	1997	1998	1999	2000	2001
Selected reserve	Officer	31.4%	31.1%	42.5%	32.4%	35.6%

Education

In FY01, 87.5 percent of selected reserve officer maintainers were college graduates, an increase from 86.3 percent in FY97.

As shown in Table 3-14, the 5 years of our study saw a 3 percent decrease in the number of SR officer maintainers with just a high school diploma, compared to a 6.4 percent decrease for active duty counterparts. On the other hand, there are more SR officer maintainers who are college graduates than their active duty counterparts (7 percent more, counting college graduates and postgraduate categories together). Decreases from FY00 to FY01 in the percentage of maintainers

with some college were offset by corresponding increases in the percentage of college graduates and postgraduate work.

Table 3-14. Percentage of Selected Reserve Commissioned Officer Maintainers by Educational Level

Level	FY97	FY98	FY99	FY00	FY01
High school graduate	10.9	2.7	3.0	5.1	7.9
Some college	2.8	10.4	10.6	15.5	4.7
College graduate	66.1	66.8	66.7	59.9	64.4
Postgraduate work	20.2	20.1	19.8	19.6	23.1

Note: Due to rounding, columns may not total 100 percent; unknowns not included in calculations.

Skills

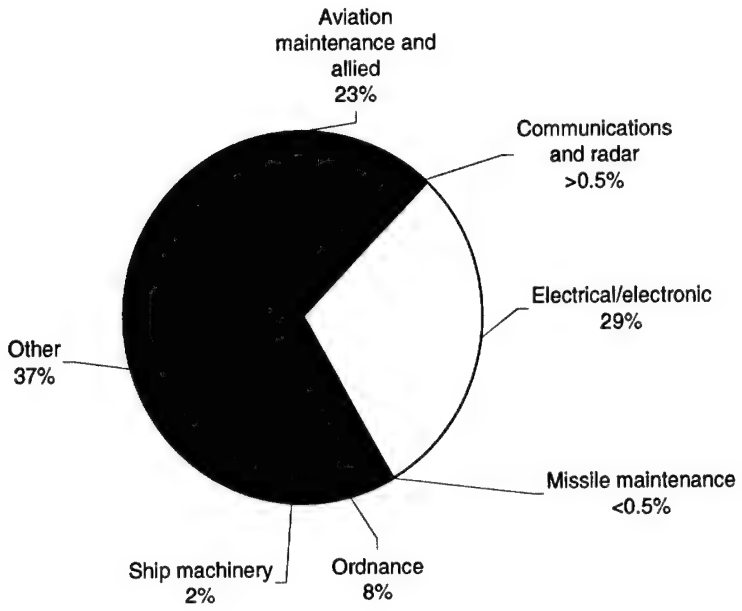
Table 3-15 stratifies the population of selected reserve officer maintainers into 9 skill categories. The skill category among the SR officer maintainers that saw the greatest change between FY97 and FY01 was the electrical/electronic category (28.4 percent decrease). This, as well as most of the other categories, appears to be real losses (15.9 percent from FY97 to FY01)—as opposed to the recategorization that we saw in the active duty officer maintenance arena. The two areas with increases are the communications and radar and the ship machinery categories. But in each case, there are very small numbers of people involved.

Table 3-15. Number of Selected Reserve Commissioned Officer Maintainers by Skill Category

Category	FY97	FY98	FY99	FY00	FY01
Other	2,201	2,183	2,239	2,092	2,040
Electrical/electronic	2,279	2,182	2,278	2,054	1,633
Aviation maintenance and allied	1,473	1,414	1,392	1,341	1,280
Ordnance	505	498	503	467	450
Ship machinery	121	134	124	121	122
Communications and radar	21	24	26	26	25
Missile maintenance	25	23	24	19	21
Automotive and allied					
Ship construction and maintenance					
Total	6,625	6,458	6,586	6,120	5,571

Figure 3-7 portrays the distribution of the selected reserve officer maintainers by skill category. The majority of these maintainers work in the electrical/electronic and aviation maintenance categories.

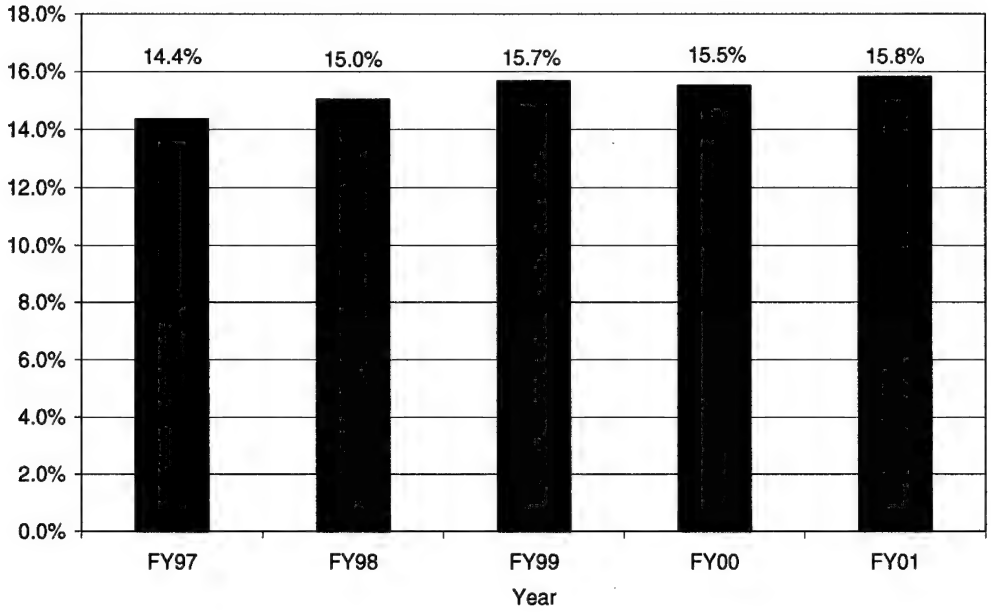
Figure 3-7. Distribution of Selected Reserve Officer Maintainers by Skill Category, FY01



Female Representation

Female representation in the selected reserve officer maintainer workforce was 15.8 percent in FY01, compared to 18.6 percent for non-maintainers. Female maintainer representation increased 1.5 percentage points from FY97 to FY01, as opposed to a 0.6 point increase for non-maintainers. The percentage changes for the study period are illustrated in Figure 3-8.

Figure 3-8. Percentage of Women in Selected Reserve Officer Maintainer Population



Minority Representation

In FY01, nearly 20 percent of selected reserve officer maintainers were classified as minorities. This compares with 15.8 percent for non-maintainers within this segment. From FY97 to FY01, there was an increase of 2.3 percentage points in minority representation for maintainers (see Table 3-16).

Table 3-16. Percentage of Minorities in the Selected Reserve Officer Maintainer Workforce

		Minorities				
	Rank	1997	1998	1999	2000	2001
Selected reserve	Officer	17.2%	17.6%	17.8%	18.5%	19.5%

SELECTED RESERVE WARRANT OFFICER MAINTAINERS

As opposed to declines in all other segments of the DoD maintainer workforce, there was an increase (9.5 percent) in the total number of selected reserve warrant officer maintainers over the last 5 years, as seen in Table 3-17. Taken by themselves, the Navy and Marine Corps Reserves lost approximately 30 percent of their warrant officer maintainers. These losses were offset by gains in the Army Guard and Reserve. Warrant officer maintainers, as a percentage of the total SR warrant officers, increased 4 percent during the FY97 to FY01 timeframe.

Table 3-17. Number of Selected Reserve Warrant Officer Maintainers by Service (in thousands)

Service	FY97	FY98	FY99	FY00	FY01	Percentage change FY97 - FY01
Maintainers						
Army Guard	1.5	1.6	1.7	1.7	1.7	11.5
Air Guard						
Navy	0.2	0.2	0.1	0.1	0.1	-28.8
Army Reserve	0.7	0.7	0.8	0.8	0.8	21.7
Air Force Reserve						
Marine Corps	0.1	0.1	0.1	0.1	0.1	-24.0
Total	2.5	2.6	2.7	2.7	2.8	9.5
Total Selected Reserve warrant officers	11.9	11.7	11.6	11.3	11.0	-7.8
Maintainers as percent of total	21.1	22.0	23.7	24.1	25.1	4.0

Note: Totals reflect rounding. Percentage calculations based on actual data.

Age

The average age of the selected reserve warrant officer maintainers was 46.7 years in FY01, compared to 44.8 years for non-maintainers. This segment of maintainers is the oldest of the military maintainers; however, the influx of new warrant officers mentioned earlier caused a decline in their average age by 1.6 percent (presented in Table 3-18).

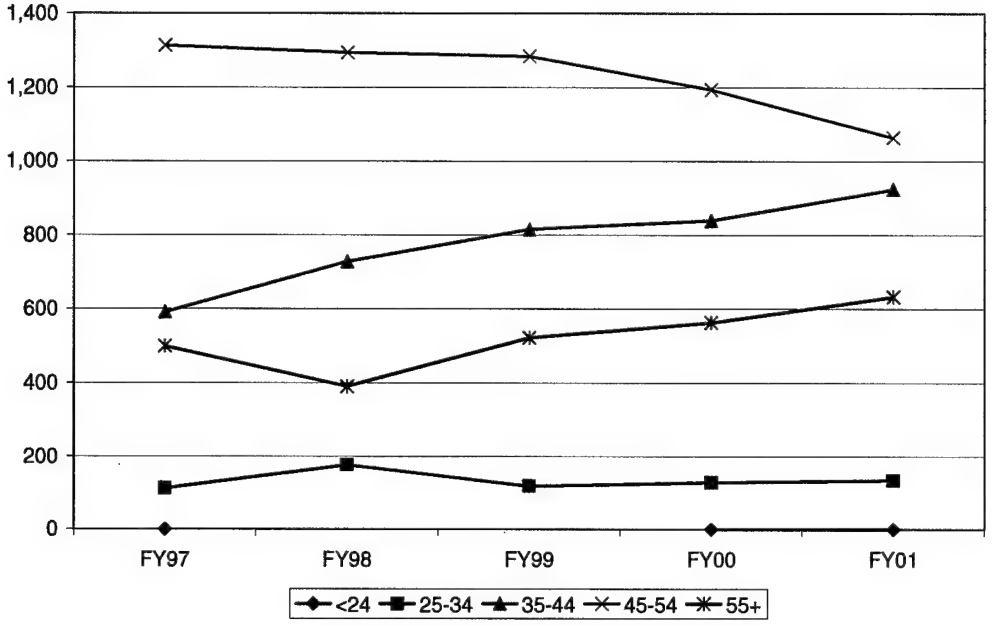
Table 3-18. Average Age of Selected Reserve Warrant Officer Maintainers

		Age (in years)					
	Rank	1997	1998	1999	2000	2001	Percentage change
Selected reserve	Warrant officer	47.4	46.9	47.0	46.9	46.7	-1.6%

Note: Totals reflect rounding. Percentage calculations based on actual data.

Figure 3-9 shows the distribution of selected reserve warrant officer maintainers by age group. With the exception of the 45–54 age bracket, which saw a decrease of almost 19 percent, there were increases in all other age brackets, ranging from 20 percent to 56 percent over the 5-year study period. This coincides with the fact that there was an overall increase in the total number of SR warrant officer maintainers.

Figure 3-9. Number of Selected Reserve Warrant Officer Maintainers by Age Group



Years of Service

The average YOS for selected reserve warrant officer maintainers was 25.6 years, compared to 23 years for non-maintainers. From FY97 to FY01, there was an overall decrease of 2.4 percent for maintainers (depicted in Table 3-19). This coincides with the influx of more warrant officers into this segment.

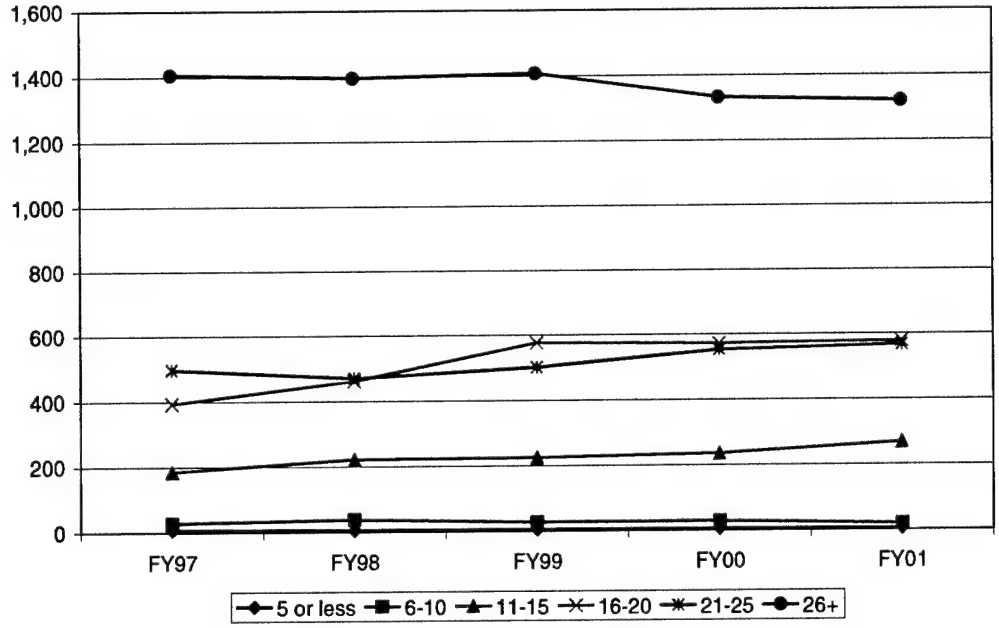
Table 3-19. Average Years of Service for Selected Reserve Warrant Officer Maintainers

		Years of service					
	Rank	1997	1998	1999	2000	2001	Percentage change
Selected reserve	Warrant officer	26.2	25.8	25.6	25.6	25.6	-2.4%

Note: Totals reflect rounding. Percentage calculations based on actual data.

As seen in Figure 3-10, there were declines in three of the six YOS groups, but the declines in the first two groups (5 or less and 6–10 YOS) are negligible due to their very small total numbers. The decline (6 percent) in the last group (those with more than 26 YOS) is noteworthy because it is the most populous group. Of the three remaining groups, the 11–15 and 16–20 groups saw increases of 45 percent and 47 percent, respectively. The 21–25 group increased 14 percent from FY97 to FY01.

Figure 3-10. Distribution of Selected Reserve Warrant Officer Maintainers by Years of Service



Retirement Eligibility

Nearly 74 percent of selected reserve warrant officer maintainers were eligible to retire in FY01. This compares with 58.7 percent for non-maintainers. Corresponding to the increase in the number of warrant officer maintainers, the percentage of warrant officer maintainers who were eligible to retire decreased 5 percentage points from FY97 to FY01, shown in Table 3-20.

Table 3-20. Percentage of Selected Reserve Warrant Officer Maintainers Eligible for Retirement

		Retirement eligible				
	Rank	1997	1998	1999	2000	2001
Selected reserve	Warrant officer	78.7%	74.5%	73.9%	74.2%	73.5%

Education

In FY01, the percentage of selected reserve warrant officer maintainers who were college graduates was 24.5 percent. This is up from 23.2 percent in FY97, as shown in Table 3-21.

The percentage of selected reserve warrant officer maintainers who earned college degrees or participated in postgraduate work remained relatively stable during the timeframe of this study, hovering around 18–19 percent for college graduates and around 5 percent for postgraduate degree earners, as depicted in Table 3-21. The

percentages of high school graduates and those with some college fluctuated greatly, due in part to changes in educational coding that took place between FY99 and FY00.

Table 3-21. Percentage of Selected Reserve Warrant Officer Maintainers by Educational Level

Level	FY97	FY98	FY99	FY00	FY01
High school graduate	59.1	39.5	36.8	38.4	66.1
Some college	17.7	37.6	38.2	38.5	9.4
College graduate	17.7	17.5	19.2	17.9	19.4
Postgraduate work	5.5	5.4	5.8	5.1	5.1

Note: Due to rounding, columns may not total 100 percent; unknowns not included in calculations.

Skills

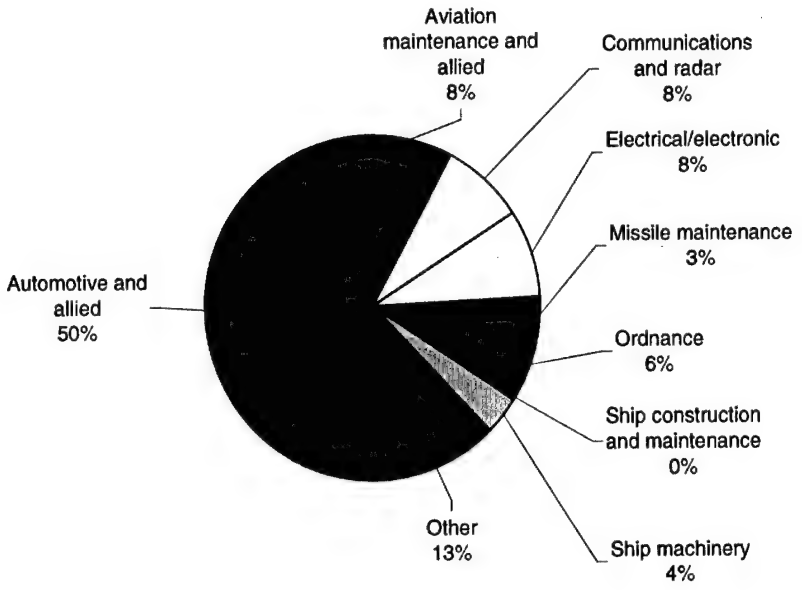
The largest decreases in skill categories from FY97 to FY01 were missile maintenance (38.3 percent), ordnance (19.6 percent), and ship construction and maintenance (20 percent), as shown in Table 3-22. With recategorization actions shifting personnel around, there was still an overall 9.5 percent increase in the total number of SR warrant officer maintainers (reflected largely in the "other" category).

Table 3-22. Number of Selected Reserve Warrant Officer Maintainers by Skill Category

Category	FY97	FY98	FY99	FY00	FY01
Automotive and allied	1,262	1,303	1,295	1,319	1,361
Other	91	96	311	322	340
Aviation maintenance and allied	253	259	255	243	232
Electrical/electronic	226	228	227	230	230
Communications and radar	230	247	242	236	224
Ordnance	214	205	189	168	172
Ship machinery	84	92	89	92	98
Missile maintenance	141	139	118	104	87
Ship construction and maintenance	15	18	14	11	12
Total	2,516	2,587	2,740	2,725	2,756

Automotive maintainers comprise the largest amount of SR warrant officer maintainers, with 50 percent of the total number working in this category. Aviation, communications and radar, and electrical/electronic maintenance each comprise 8 percent of the total (see Figure 3-11).

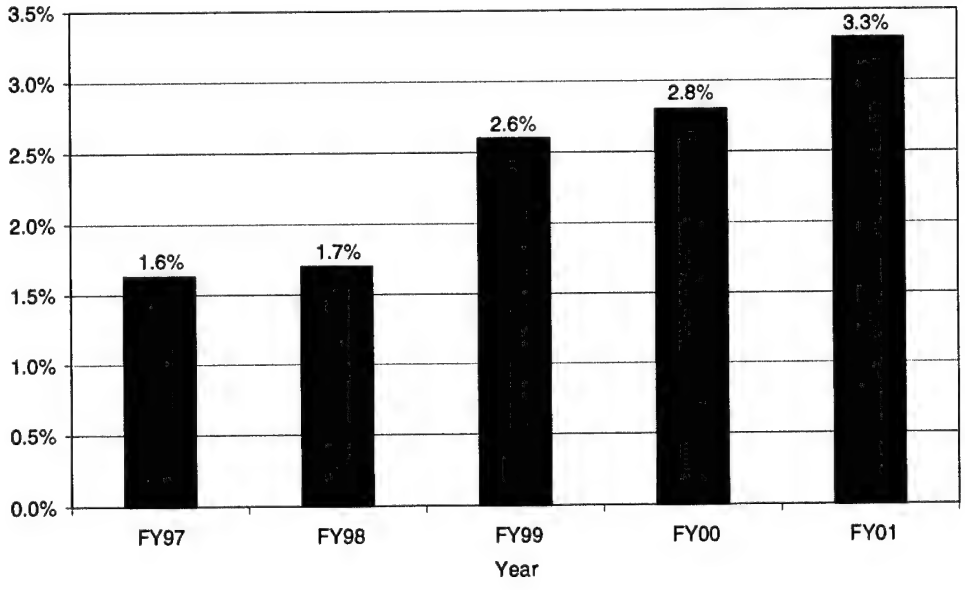
Figure 3-11. Distribution of Selected Reserve Warrant Officer Maintainers by Skill Category, FY01



Female Representation

In FY01, 3.3 percent of the selected reserve warrant officer maintainer population was female. In the same timeframe and segment, women constituted 8.9 percent of the non-maintainer workforce. There was a steady increase in the percentage of women in the maintainer workforce between FY97 and FY01 (from 1.6 percent to 3.3 percent), as depicted in Figure 3-12.

Figure 3-12. Percentage of Women in Selected Reserve Warrant Officer Maintainer Population



Minority Representation

The percentage of minorities in the selected reserve warrant officer maintainer workforce was 11.2 percent in FY01. This compares to 9.5 percent representation for non-maintainers. Percentage point increases for maintainers and non-maintainers were 2.8 and 2.1 points, respectively. The increase for maintainers is shown in Table 3-23.

Table 3-23. Percentage of Minorities in the Selected Reserve Warrant Officer Maintainer Workforce

		Minorities				
	Rank	1997	1998	1999	2000	2001
Selected reserve	Warrant officer	8.4%	9.5%	9.7%	10.4%	11.2%

Chapter 4
Civilian Maintainers

Of the total 669,900 civilians in DoD in FY01, 124,300 (18.6 percent) of these were maintainers. From FY97 to FY01, there was a decline of 9.8 percent in the total number of these maintainer civilians, portrayed in Table 4-1. This decline was very consistent with the total DoD civilian population, which declined 10 percent over the same period.

Table 4-1. Number of DoD Civilian Maintainers (in thousands)

	FY97	FY98	FY99	FY00	FY01	Percentage change FY97 - FY01
Blue collar	101.7	97.4	93.0	91.8	91.7	-9.8
White collar	36.1	34.2	33.0	32.8	32.6	-9.8
Total	137.8	131.7	126.0	124.6	124.3	-9.8

Note: Totals reflect rounding. Percentage calculations based on actual data.

We look first at an in-depth characterization of the blue- and white-collar maintainers. We will then discuss the number of civilian maintainers divided between field and depot-level maintenance. This information is extracted from an earlier LMI study.[1]

DoD Blue-Collar Maintainers

Maintainers comprise almost 60 percent of the DoD blue-collar workforce. Although there has been a decrease of 9.8 percent in the number of blue-collar maintainers over the 5 years studied, the number of maintainers (as a percentage of the total DoD blue-collar civilians) increased from 55.6 percent to 59.3 percent (as seen in Table 4-2). Total DoD blue-collar civilians decreased by more than 15 percent during the same timeframe.

[1] Logistics Management Institute, *Civilian Maintenance Workforce Characterization,* Regina S. Clifford, LG101L5, September 2002. This report, with portions excerpted here, examined the breakout of the civilian workforce, categorized into field and depot maintenance levels.

Table 4-2. Number of DoD Blue-Collar Maintainers by Service (in thousands)

Service	FY97	FY98	FY99	FY00	FY01	Percentage change FY97 - FY01
Maintainers						
Air Force	41.3	39.9	37.7	37.0	37.3	-9.6
Army	31.5	30.2	29.5	29.5	29.8	-5.3
Navy	25.5	24.2	22.9	22.4	21.9	-13.9
Marine Corps	2.4	2.2	2.1	2.2	2.0	-17.8
DLA and other DoD	1.0	0.9	0.8	0.7	0.7	-37.4
Total	101.7	97.4	93.0	91.8	91.7	-9.8
Total DoD blue collar civilians	182.9	173.2	164.6	158.8	154.7	-15.4
Maintainers as percent of total	55.6	56.3	56.5	57.8	59.3	6.6

Note: Totals reflect rounding. Percentage calculations based on actual data.

Age

The average age of blue-collar maintainers in FY01 was 45.1 years. For non-maintainers, the average age was 47.4. From FY97 to FY01, the increase for maintainers was 0.9 percent, as shown in Table 4-3. The increase for non-maintainers was a comparable 1.1 percent.

Table 4-3. Average Age of Blue-Collar Maintainers

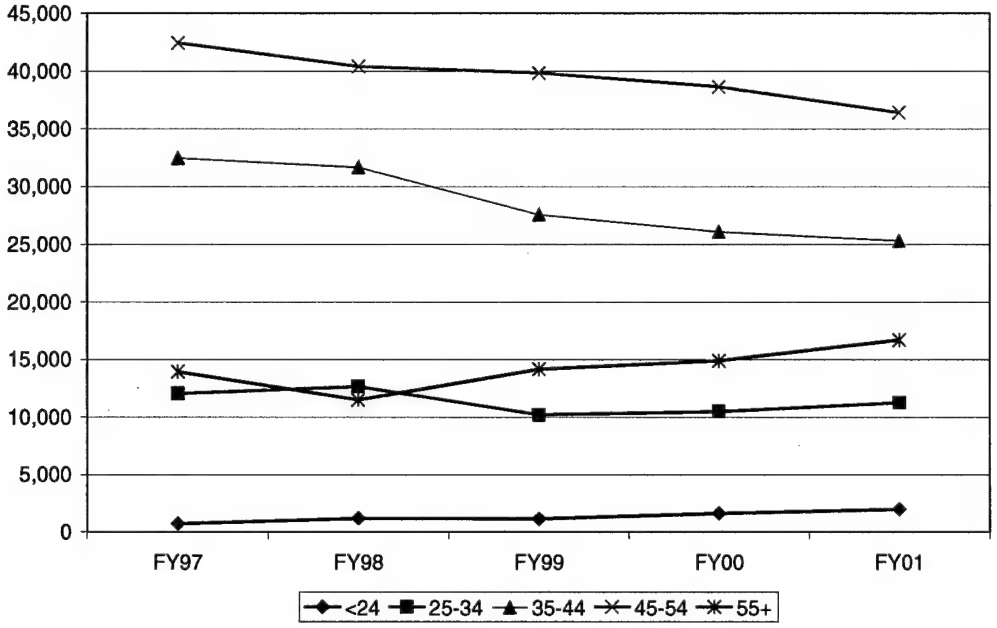
		Age (in years)					
		1997	1998	1999	2000	2001	Percentage change
Civilian	Blue collar	44.7	45.1	45.2	45.2	45.1	0.9%

Note: Totals reflect rounding. Percentage calculations based on actual data.

During the study period, the number of maintainers in the 35–44 age range declined 22 percent, followed by a 14 percent decline in the 45–54 age group and a 6.7 percent decline in the 25–34 age group, as shown in Figure 4-1. Increases were evident in the oldest (19.7 percent for 55+ group) and youngest (175.6 percent for the under 24 age group) brackets, although the youngest group involves a relatively small number of people.

It is interesting to note that, in spite of declines in the 35–44 and 45–54 year groups, more than 44 percent of the blue-collar maintainers who entered civil service between FY97 and FY01 were 35 years of age or older. One explanation for this might be the number of retiring military members who elect to continue working in the public sector.

Figure 4-1. Number of Blue-Collar Maintainers by Age Group



Years of Service

In FY01, the average number of years of service for blue-collar maintainers was 17.2 years. This compares with 16.9 years for non-maintainers. During the 5-year period of our study, the average YOS for maintainers remained relatively stable (depicted in Table 4-4). The increase for non-maintainer YOS was 9 percent during the same period.

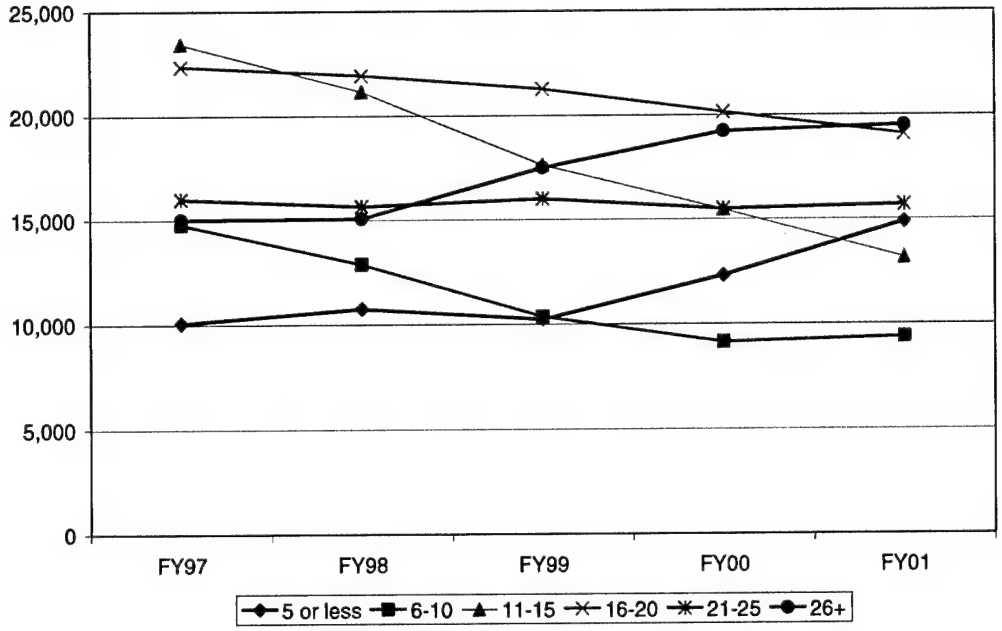
Table 4-4. Average Years of Service for Blue-Collar Maintainers

		Years of service					
		1997	1998	1999	2000	2001	Percentage change
Civilian	Blue collar	17.1	17.7	17.6	17.6	17.2	1.0%

Note: Totals reflect rounding. Percentage calculations based on actual data.

While the overall average years of service remained relatively stable, there were some major shifts within the various year groups, with the least and most senior groups showing gains. These shifts are presented in Figure 4-2. The other four YOS groups all show declines, with significant declines between 37 percent and 44 percent in the 6–10 and 11–15 YOS groups.

Figure 4-2. Distribution of Years of Service for Blue-Collar Maintainers



Retirement Eligibility

The percentage of blue-collar maintainers in FY01 who were eligible to retire was 5.5 percent. This compares with 7.3 percent for non-maintainers during the same period. Rising almost 2 percentage points from FY97 to FY01, this figure is consistent with the increase in the number of blue-collar maintainers with 26 or more years of service, as seen in the previous section. Table 4-5 shows these percentages.

Table 4-5. Percentage of Blue-Collar Maintainers Eligible for Retirement

		Retirement eligible				
		1997	1998	1999	2000	2001
Civilian	Blue collar	3.6%	4.1%	4.7%	5.0%	5.5%

Education

The percentage of blue-collar maintainers with high school diplomas stood at 97.1 percent in FY01. Educational data were not tracked from FY97 to FY99; however, there was an increase in the percentage of these graduates (from 94.2 to 97.1 percent, as depicted in Table 4-6).

Table 4-6. Percentage of DoD Blue-Collar Maintainers by Educational Level

Level	FY97	FY98	FY99	FY00	FY01
Some high school				2.9%	2.7%
High school graduate				67.0%	72.1%
Some college				27.2%	25.0%
College graduate				3.0%	2.9%

Note: Columns may not total 100 percent due to rounding; unknowns not included in calculations.

Skills

Table 4-7 portrays the number of blue-collar civilian maintainers by skill category. There were declines in each category, with those in the crafts category being the most significant. This category declined 15.5 percent, a substantial amount because it comprises 25 percent of the total blue-collar maintainer workforce. The declines in the other categories, including miscellaneous, were consistent with the 9.8 percent overall decline for the blue-collar maintainer segment. There were no increases to offset these declines.

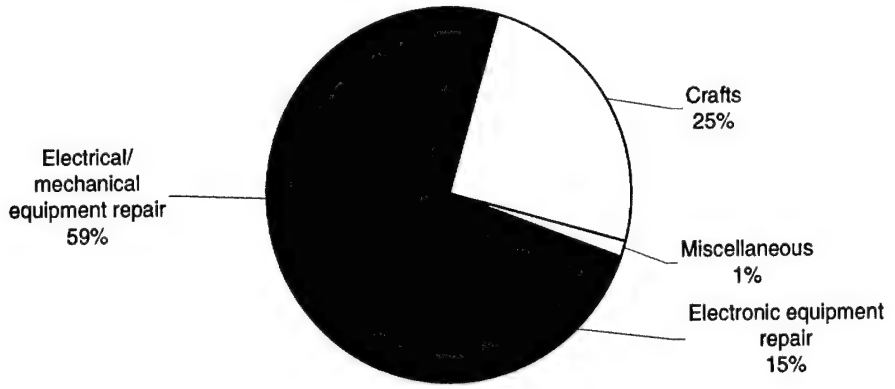
Table 4-7. Number of DoD Blue-Collar Maintainers by Skill Category

Category	Subcategory	FY97	FY98	FY99	FY00	FY01
Electrical/ mechanical equipment repair	Aircraft and aircraft related	22,018	21,569	20,913	20,852	21,438
	Automotive	15,783	15,066	14,642	14,765	14,793
	Other mechanical and electrical equipment	12,237	11,893	11,382	11,209	10,986
	Armament and munitions	5,057	4,734	4,440	4,226	4,135
	Precision equipment	1,680	1,581	1,460	1,373	1,362
	Shipboard propulsion	1,026	1,100	1,042	1,183	1,162
	Wire communications	726	696	627	580	579
	Power generating equipment	76	64	59	50	47
	Missile mechanical and electrical	25	27	24	21	17
	Subtotal	58,628	56,730	54,589	54,259	54,519
Crafts	Metalworking	19,564	18,453	17,067	16,727	16,675
	Other crafts	5,267	4,903	4,534	4,315	4,140
	Fabric, leather, and rubber	1,933	1,816	1,811	1,851	1,791
	Subtotal	26,764	25,172	23,412	22,893	22,606
Electronic equipment repair	Other electronic equipment	14,268	13,683	13,153	12,803	12,743
	ADP Computers	634	600	567	548	561
	Subtotal	14,902	14,283	13,720	13,351	13,304
Miscellaneous		1,365	1,249	1,244	1,263	1,250
Total		101,659	97,434	92,965	91,766	91,679

While there were some large decreases within the subcategories (32 percent for missile mechanical and electrical and 38.2 percent for power generating equipment), the overall decline for blue-collar maintainers was 9.8 percent. There were recategorization actions within the civilian workforce just as there were in the active duty workforce, which may explain these large decreases.

The relative populations of the categories remained fairly stable over the last decade, with the largest segment being the electrical/mechanical equipment repairers (over 59 percent), and the crafts category following at 25 percent of the total blue-collar maintainers. Figure 4-3 indicates the skill category distribution in FY01.

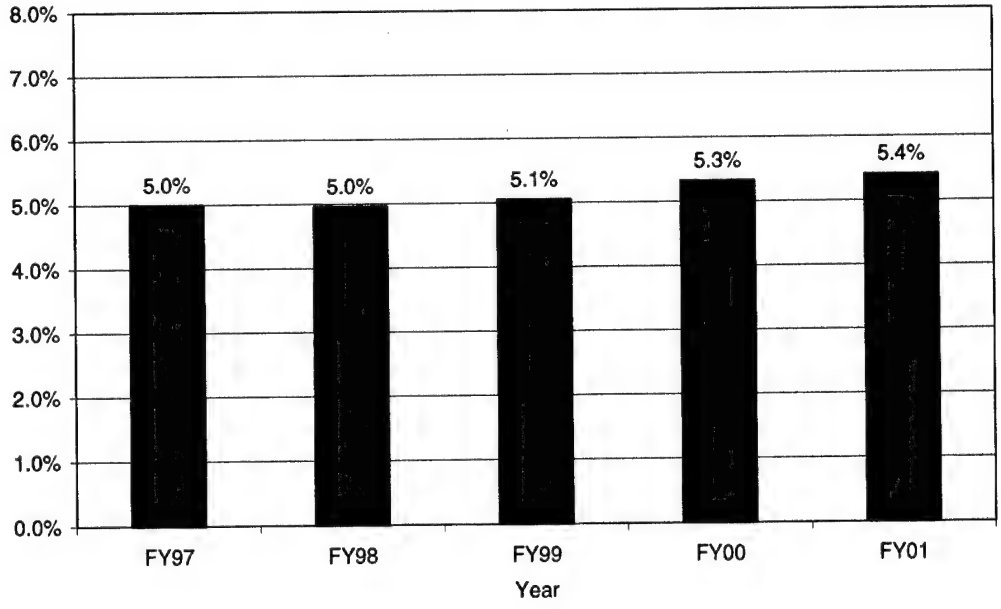
Figure 4-3. Distribution of DoD Blue-Collar Maintainers by Skill Category, FY01



Female Representation

The percentage of women in the blue-collar maintainer workforce was 5.4 percent in FY01. This compares to 12.2 percent in the blue-collar non-maintainer workforce. Both workforces saw small increases from FY97 to FY01 (0.4 points for maintainers and 0.8 points for non-maintainers). The maintainer increases are presented in Figure 4-4.

Figure 4-4. Percentage of Women in Civilian Blue-Collar Maintainer Population



Minority Representation

The percentage of minority representation in the blue-collar maintainer workforce was 24 percent in FY01, compared with 38.1 percent in the non-maintainer workforce for the same period. Although non-maintainers saw a 0.3 percentage point increase in minority representation from FY97 to FY01, blue-collar maintainers experienced a 0.5 percentage point decrease, as depicted in Table 4-8. The white-collar maintainer workforce also experienced a 0.5 percent decline in minority representation. These decreases in the civilian minority representation were counter to increases in all other segments, all non-maintainer segments, and the general U.S. population, which increased 2 percent from 1995 to 2000.[2]

Table 4-8. Percentage of Minorities in the Blue-Collar Maintainer Workforce

		Minorities				
		1997	1998	1999	2000	2001
Civilian	Blue collar	24.5%	24.6%	23.8%	23.8%	24.0%

DoD White-Collar Maintainers

There was a 9.8 percent decrease in the number of white-collar civilian maintainers from FY97 to FY01, as shown in Table 4-9. Unlike the blue-collar workforce, in which they comprise three-fifths of the blue-collar workforce, maintainers are only about 6 percent of the total DoD white-collar workforce. This ratio was consistent over the study period, indicating the white-collar maintainer workforce reduction of about 10 percent was consistent with the overall decline in DoD white-collar workers.

[2] Richard W. Judy and Carol D'Amico, *Workforce 2020: Work and Workers in the 21st Century*, Hudson Institute, 1997. Hudson Institute researchers maintain that minority representation in the U.S. population is growing slowly but steadily. This slow national growth, however, masks great regional differences, with the western states, particularly California, growing much more rapidly than other portions of the country.

Table 4-9. Number of DoD White-Collar Maintainers by Service (in thousands)

Service	FY97	FY98	FY99	FY00	FY01	Percentage change FY97 - FY01
Maintainers						
Air Force	10.2	9.6	9.1	9.0	8.8	-14.0
Army	7.9	7.3	7.1	7.1	7.0	-11.6
Navy	14.9	14.3	14.0	14.0	14.1	-5.2
Marine Corps	0.5	0.5	0.5	0.5	0.5	-5.4
DLA and other DoD	2.6	2.5	2.3	2.2	2.2	-15.0
Total	36.1	34.2	33.0	32.8	32.6	-9.8
Total DoD white collar civilians	563.0	544.5	525.3	521.9	515.2	-8.5
Maintainers as percent of total	6.4	6.3	6.3	6.3	6.3	-0.1

Note: Columns may not total 100 percent due to rounding; unknowns not included in calculations.

Age

The average age of white-collar maintainers in FY01 was 47.8 years. This compares with 46.5 years for white-collar non-maintainers. For maintainers, this is an increase of 1.5 percent from FY97 to FY01 (see Table 4-10). The average age of non-maintainers increased 2.6 percent during the same period.

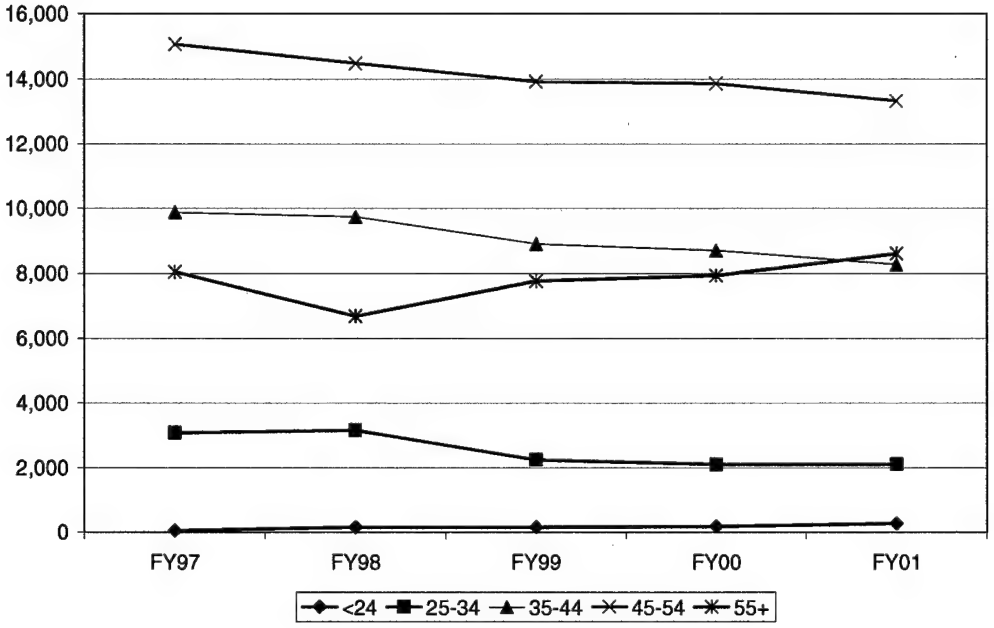
Table 4-10. Average Age of White-Collar Maintainers

		Age (in years)					
		1997	1998	1999	2000	2001	Percentage change
Civilian	White collar	47.1	47.5	47.5	47.6	47.8	1.5%

Note: Columns may not total 100 percent due to rounding; unknowns not included in calculations.

As with blue-collar maintainers, the white-collar segment had losses in its middle three age groups, and gains in the youngest and oldest groups (see Figure 4-5). Although not perceptible on the chart because of overall low numbers, the increase in the under-24 age group was more than 430 percent (from 51 in FY97 to 271 in FY01).

Figure 4-5. Number of White-Collar Maintainers by Age Group



Years of Service

The average YOS for white-collar maintainers was 19.8 years in FY01. In comparison, the average for non-maintainers was 17.0 years. For maintainers, there was a 3.1 percent increase during the timeframe of our study (shown in Table 4-11), as opposed to a 9 percent increase for non-maintainers.

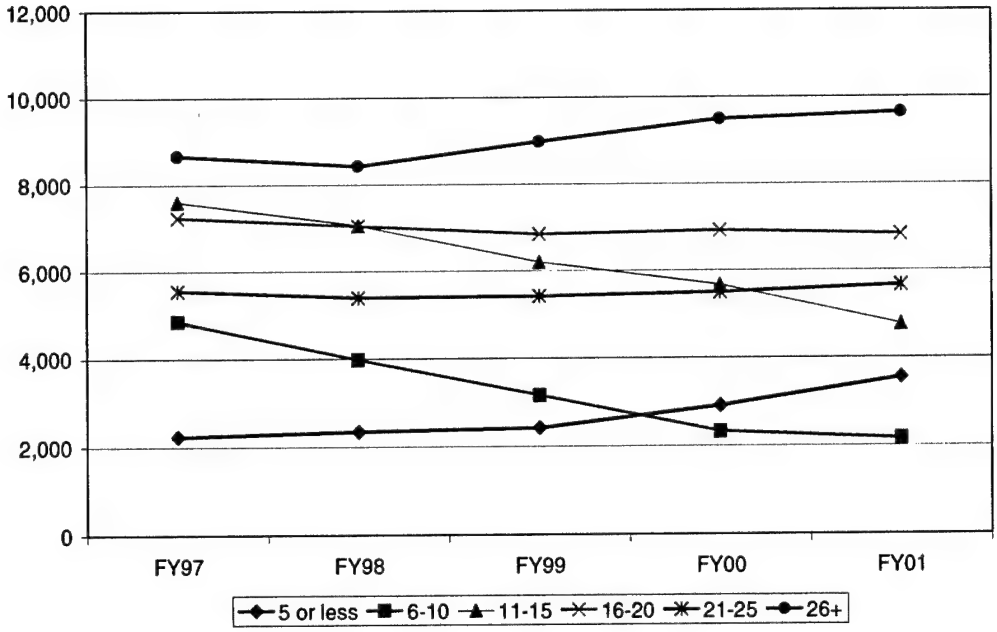
Table 4-11. Average Years of Service for White-Collar Maintainers

		Years of service					
		1997	1998	1999	2000	2001	Percentage change
Civilian	White collar	19.2	19.9	19.5	19.8	19.8	3.1%

Note: Columns may not total 100 percent due to rounding; unknowns not included in calculations.

The most populous YOS group throughout the study period remained the 26 or more YOS group (see Figure 4-6). This group increased more than 11 percent between FY97 and FY01. The largest increase (58 percent) was in the 5 or less YOS group. Three of the YOS groups (6–10, 11–15, and 16–20) declined, while the 21–25 YOS group had a modest gain of almost 2 percent.

Figure 4-6. Distribution of Years of Service for White-Collar Maintainers



Retirement Eligibility

In FY01, 11.1 percent of the white-collar maintainers were eligible to retire. In comparison, only 8.4 percent of the non-maintainers were eligible. For maintainers, this is a 2.6 point increase over FY97 (seen in Table 4-12). This is similar to the 2.2 percentage point increase for non-maintainers.

Table 4-12. Percentage of White-Collar Maintainers Eligible for Retirement

		Retirement eligible				
		1997	1998	1999	2000	2001
Civilian	White collar	8.5%	9.5%	10.0%	10.4%	11.1%

Education

In FY01, 34.2 percent of white-collar maintainers were college graduates. This percentage remained relatively unchanged from FY00, when it was 34.3 percent. No data were available for FY97 through FY99. The education distribution of white-collar civilian workforce is provided in Table 4-13.

Table 4-13. Percentage of DoD White-Collar Maintainers by Educational Level

Level	FY97	FY98	FY99	FY00	FY01
High school graduate				33.1%	34.7%
Some college				32.6%	31.2%
College graduate				26.0%	25.9%
Postgraduate work				8.3%	8.3%

Note: Columns may not total 100 percent due to rounding; unknowns not included in calculations.

Skills

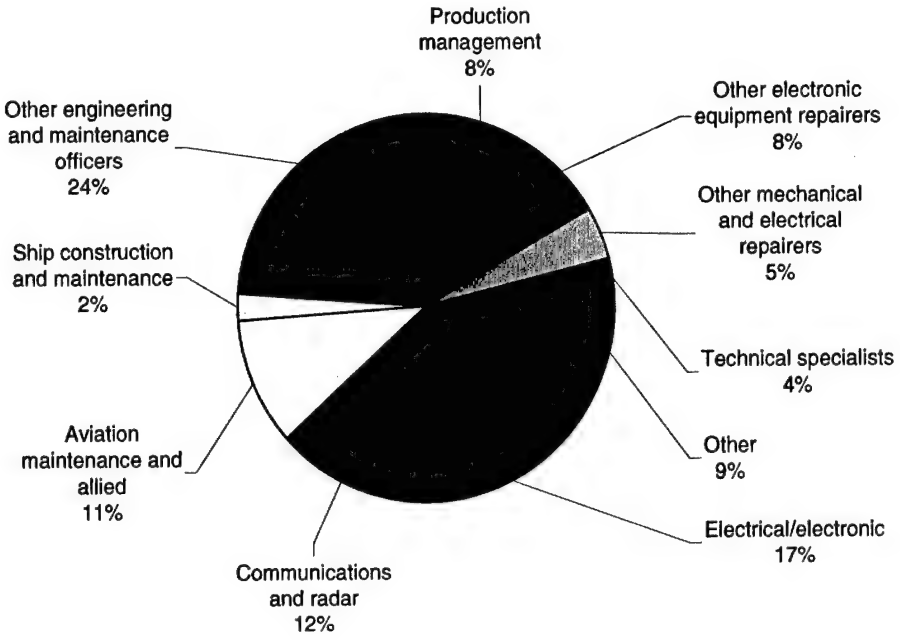
The largest decrease in the skills categories of the white-collar maintainers was in the "other mechanical and electrical repairers" category, with a 22.5 percent decrease over the 5 years (as depicted in Table 4-14); however, there was a 9.8 percent overall reduction.

Table 4-14. Number of DoD White-Collar Maintainers by Skill Category

Category	FY97	FY98	FY99	FY00	FY01
Other engineering and maintenance officers	8,825	8,433	8,086	7,981	7,987
Electrical/electronic	7,023	6,467	6,109	6,031	5,988
Communications and radar	3,881	3,968	4,088	4,132	3,774
Aviation maintenance and allied	3,677	3,512	3,460	3,376	3,424
Other	3,374	3,208	2,939	2,804	2,800
Production management	2,912	2,666	2,566	2,573	2,669
Other electronic equipment repairers	2,375	2,387	2,441	2,472	2,538
Other mechanical and electrical repairers	1,899	1,519	1,448	1,521	1,471
Technical specialists	1,337	1,253	1,070	1,121	1,162
Ship construction and maintenance	843	810	801	785	783
Total	36,146	34,223	33,008	32,796	32,596

The largest percentage of white-collar maintainers work in a category labeled "other engineering and maintenance officers" (24 percent of the total white-collar maintainers). Seventeen percent work in the electrical/electronic maintenance arena, followed by 12 percent in communications and radar, and 11 percent in aviation, as shown in Figure 4-7.

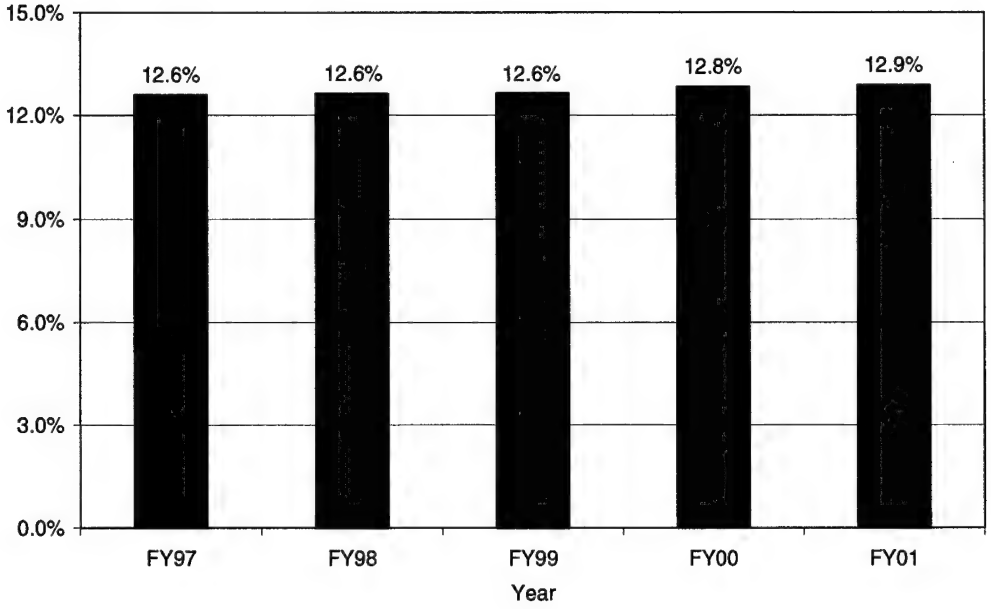
Figure 4-7. Distribution of DoD White-Collar Maintainers by Skill Category, FY01



Female Representation

In FY01, 12.9 percent of the white-collar maintainer population was female. This compares with 48.6 percent for non-maintainers in this segment. While the percentage of female maintainers increased slightly (0.3 points) from FY97 to FY01, the percentage of non-maintainer females decreased from 50.2 percent to 48.6 percent (1.6 points). The percentage of female maintainers is depicted in Figure 4-8.

Figure 4-8. Percentage of Women in Civilian White-Collar Maintainer Population



Minority Representation

The percentage of minority representation in the white-collar maintainer workforce was 18.6 percent in FY01. This compares with 26.6 percent in the non-maintainer workforce for the same period. Just as with the blue-collar workforce, there was a 0.5 percentage point decrease from FY97 for maintainers and a 0.3 percentage point increase for non-maintainers. Table 4-15 presents the percentage of minority representation in maintenance from FY97 to FY01. As mentioned earlier, these declines in both blue-collar and white-collar civilian minority representation were counter to increases in all other segments, all non-maintainer segments, and the general U.S. population.

Table 4-15. Percentage of Minorities in the White-Collar Maintainer Workforce

		Minorities				
		1997	1998	1999	2000	2001
Civilian	White collar	19.1%	19.0%	18.8%	18.6%	18.6%

CIVILIAN MAINTAINERS—FIELD AND DEPOT LEVELS

As mentioned, there are more than 124,000 civilian maintainers employed in DoD maintenance activities, which are categorized as depot- and field-level maintenance. We use the term "field" very broadly; it designates all units and activities outside the depot maintenance activities. Within the depot and field levels, there are

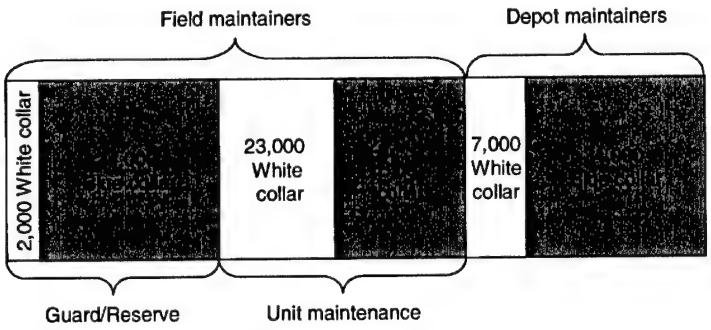
- 41,000 depot-level maintainers and
- 83,000 field-level maintainers.

Table 4-16 breaks these aggregate numbers out by blue- and white-collar positions held at both levels of maintenance. Figure 4-9 is a further breakout of civilian maintainers.

Table 4-16. Breakout of Civilian Maintainers

Activity	Blue collar	White collar	Total maintainers
Depot	34,000	7,000	41,000
Field	58,000	25,000	83,000
Totals	92,000	32,000	124,000

Figure 4-9. Stratification of Civilian Maintainers



We first focus our attention on the large segment labeled in Figure 4-9 as "field maintainers." The total number of field-level maintainers is 83,000, of which 58,000 are blue-collar employees—the largest portion of the total blue-collar maintainer workforce (92,000), as shown in Table 4-16. It is apparent that a substantial number (63 percent) of the total blue-collar maintainer workforce is engaged at the field level. It is because of this large number of field-level blue-collar maintainers that we examined this segment of maintainers in greater detail.

Within the field-level maintenance activities, we delineated two major subdivisions designated as the Guard/Reserve Technician Program and all other field-level activity outside of the Army Guard or Reserve, which we call unit

maintenance. Because the Guard/Reserve Technician Program constitutes almost one half of the 83,000 field-level maintainers, we examined this program and its maintainer numbers in more detail.

Field-Level Maintainers—Guard/Reserve Technician Program

There are 36,000 Guard/Reserve technicians (as shown in Figure 4-9) serving in DoD maintenance activities, almost one-half of the total field-level civilian maintainers.[3] These technicians are full-time civil service employees who also perform part-time military service (generally one weekend a month, although there are variations based on unit, mission, and individual needs). Military membership is a requirement for these civil service positions. Mostly wage grade and some general schedule employees, the Guard/Reserve technicians work throughout the week maintaining unit-assigned equipment and providing maintenance training for traditional reservists.

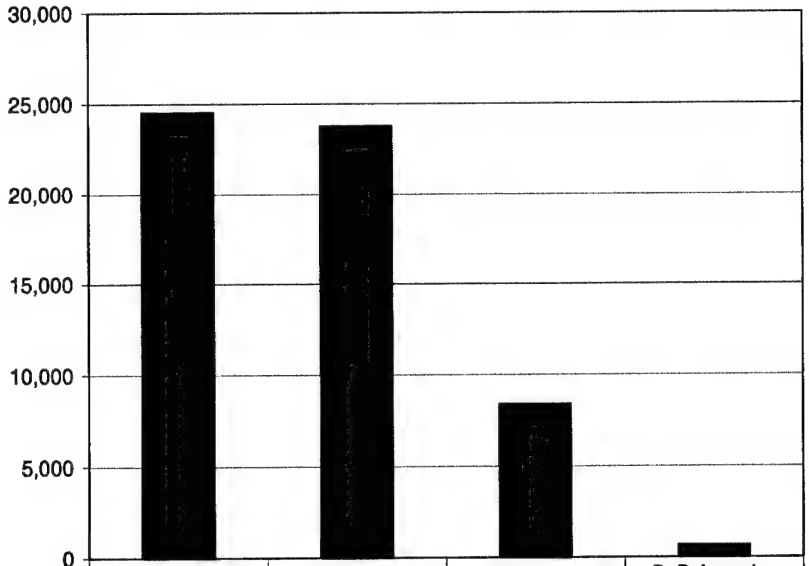
The majority (94 percent) of the 36,000 Guard and Reserve technician maintainers are blue-collar personnel employed in the trades, while only 2,000 are white-collar maintainers. Because of the small number of Guard and Reserve technician white-collar maintainers, we focused on the 34,000-person blue-collar workforce, and will discuss their composition by service component in greater detail. These 34,000 blue-collar employees represent 37 percent of the total 92,000 blue-collar civilian maintainers in DoD and 59 percent of the 58,000 blue-collar field maintainers.

Figure 4-10 and Figure 4-11 show the number of Guard and Reserve technician maintainers in relationship to strictly civilian maintainers (who hold no military membership obligations with their position). It is interesting to note there are strictly civilian maintainers working in the reserve forces, but our emphasis here is on the maintainers who hold military membership as a condition of their civilian employment.

The breakout of blue-collar Guard and Reserve technicians by service is shown in Figure 4-10. The Army and the Air Force account for all 34,000 personnel, with no Guard or Reserve technicians employed in the other services or agencies. Guard and Reserve technicians in the Army comprise approximately 65 percent of its total blue-collar field maintainers, while the Air Force percentage for this group is 75 percent.

[3] This number does not represent all of the maintainers serving with the reserve forces, because some serve in an active duty capacity as Active Guard or Reserve (AG/R) members.

Figure 4-10. Blue-Collar Guard and Reserve Technicians by Service

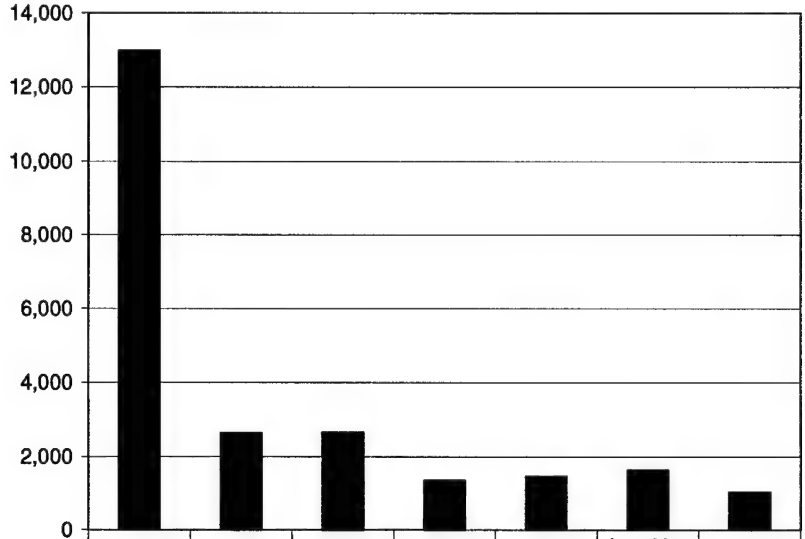


	Air Force Total	Army Total	Navy Total	DoD Agencies Total
Guard/Reserve Technicians	18398	15431	0	0
Civilians	6118	8330	8395	650

BLUE-COLLAR GUARD AND RESERVE TECHNICIANS IN THE ARMY

Within the Army, Guard and Reserve technicians employed as blue collar field maintainers are primarily found in the Army National Guard and Army Reserve Command, with the remainder (about 0.3 percent) scattered in other commands, as shown in Figure 4-11. All Army National Guard blue-collar civilian maintainers work as Guard and Reserve technicians, whereas approximately 10 percent of maintainers in the Army Reserve Command are strictly civilians (their positions hold no military membership obligations).

Figure 4-11. Army Guard/Reserve Technicians by Command



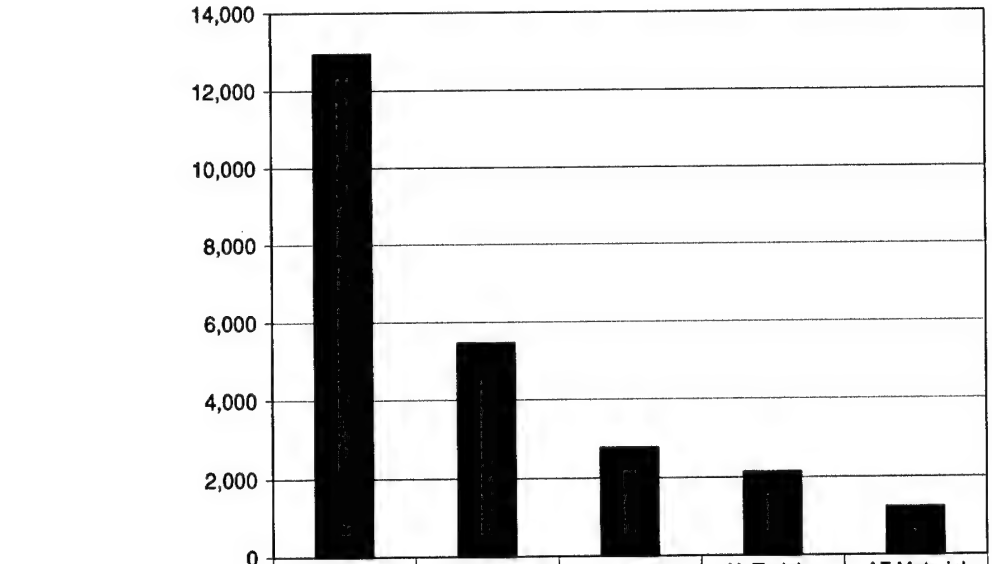
	National Guard	Reserve Command	Other Army	Forces Command	Corps of Engineers	Arm, Mun & Chem Cmd	Trng & Doc Cmd
Guard/Reserve Technicians	12985	2396	34	8	7	1	0
Civilians	0	243	2625	1346	1449	1627	1040

Notes: Arm, Mun & Chem Cmd = Armaments, Munitions, and Chemical Command; Trng & Doc Cmd = Training and Doctrine Command.

BLUE-COLLAR GUARD AND RESERVE TECHNICIANS IN THE AIR FORCE

As with the Army, the majority of the Air Force's Guard and Reserve technicians who work as maintainers can be found in the Air National Guard and the Air Force Reserve, with less than 1 percent assigned to all other commands. However, the Air Force Reserve Command employs only 2 percent of its full-time maintenance force as strictly civilian, as opposed to the Army Reserve Command, which employs 10 percent. Figure 4-12 displays the Air Force's mix of Guard and Reserve technician and civilian maintainers.

Figure 4-12. Air Force Guard/Reserve Technicians by Command



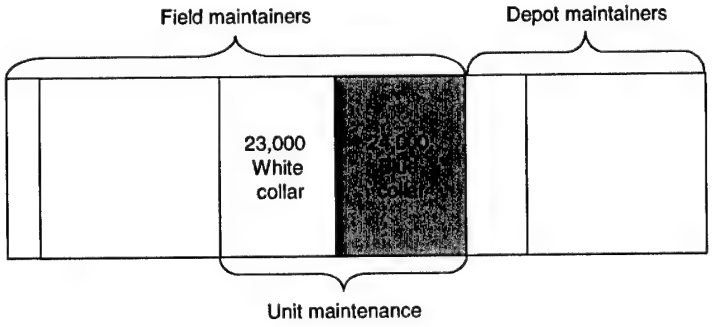
	Air National Guard	Air Force Reserve	Other AF	Air Training Cmd	AF Materiel Cmd
■ Guard/Reserve Technicians	12938	5313	147	0	0
■ Civilians	0	137	2622	2131	1228

Note: AF = Air Force.

Field-Level Maintainers—Unit Maintenance

Unit maintenance personnel can be described as civilians other than Guard or Reserve who are employed at DoD installations, bases, or headquarters and contribute to the management and maintenance of the various weapon systems. There are a total of 47,000 unit civilian maintainers in this category, as portrayed in Figure 4-13.

Figure 4-13. Unit Maintainers



The majority (75 percent) of the 23,000 white-collar unit maintainers work in engineering fields:

- Aviation maintenance (3,000)
- Communications and radar (3,300)
- Construction and utilities (1,000)
- Electrical/electronic (5,100)
- Other engineering specialties (4,200)
- Ship construction (600).

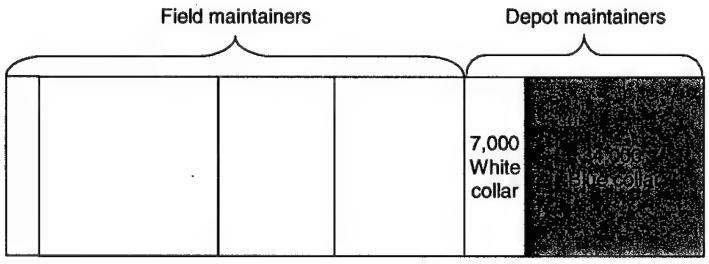
The remaining 5,900 white-collar unit maintainers are employed in electrical and electronic equipment repairs, administration, and procurement.

Of the blue-collar unit maintainers, 74 percent work as electrical/mechanical and electronic equipment repairers. Crafts workers, engineering, and auxiliary labor comprise the better part of the remaining 26 percent.

Depot-Level Maintainers

Rounding out the category of civilian maintainers are those employed at the numerous depots, as presented in Figure 4-14. Crafts workers and electrical/mechanical equipment repairers constitute the bulk of the blue-collar depot maintainer workforce, with each career category being more than 14,000 strong. Third in strength are the electronic equipment repairers, with almost 4,800 employees in this category.

Figure 4-14. Depot-Level Maintainers

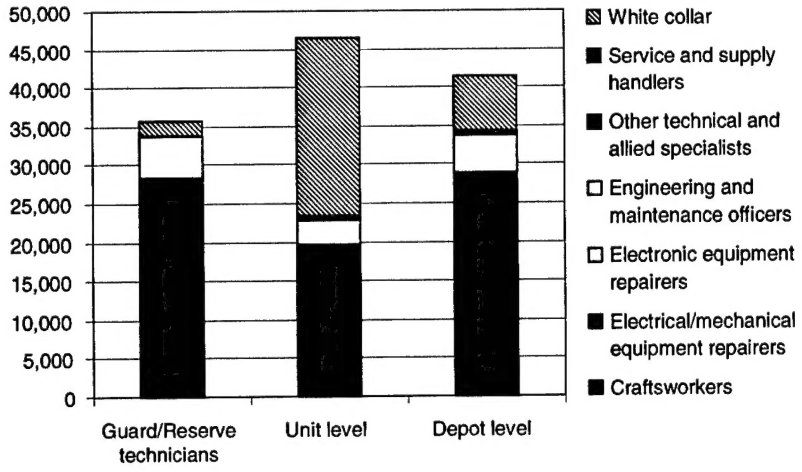


The majority (54 percent) of the 7,000 white-collar maintainers at the depot level work as engineering and maintenance officers. Functional support and administration and other technical specialists each garner approximately 14 percent of this population, while procurement and production functions account for about 11 percent of the total white-collar depot maintainers.

Summary—Civilian Maintainers

Figure 4-15 summarizes the three divisions of civilian maintainers by occupational code within their respective maintenance activity.

Figure 4-15. Civilian Maintainer Occupational Categories by Maintenance Level



Appendix
Abbreviations

2LM	two-level maintenance
ADUSD(MPP&R)	Assistant Deputy Under Secretary for Maintenance Policy, Programs, and Resources
AFQT	Armed Force Qualification Test
CLS	contractor logistics support
LDO	limited duty officer
MTW	major theater war
SR	selected reserve
YOS	years of service

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14. ABSTRACT
We identified the characteristics of the FY01 DoD maintenance workforce, placing it in the larger context of the total DoD workforce and analyzing trends from FY97 to FY01. We evaluated the workforce in terms of age, years of service, retirement eligibility, Armed Forces Qualification Test scores, education, skills, and female and minority representation. We found a significant decrease in the average years of service for active duty enlisted maintainers in the mid-career brackets; decreases in the percentage of minority representation in both blue collar and white collar civilian segments; and decreases in total numbers of both civilian segments (almost double the reductions of total numbers for maintainers and DoD overall). Other decreases and changes in the remainder of the population were otherwise consistent with reductions throughout DoD.

15. SUBJECT TERMS
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Logistics Management Institute
2000 Corporate Ridge
McLean, Virginia 22102-7805
703-917-9800
www.lmi.org